

Company: CONOCOPHILLIPS CANADA RESOURCES CORP.

Well: COPRC DODO CANYON E76

Field: DODO CANYON

Province: NORTHWEST TERRITORIES

PLATFORM EXPRESS ***MD***

COMPENSATED NEUTRON

DUAL LITHOLOGY DENSITY LOG

Province: NORTHWEST TERRITORIES
Field: DODO CANYON
Location: UNIT E SECTION 76
Well: COPRC DODO CANYON E76
Company: CONOCOPHILLIPS CANADA RESOURCES COLocation:
UNIT E SECTION 76
300E766510126450
NORTHING: 7219874.66 EASTING: 594010.01
Permanent Datum: Ground Level
Log Measured From: Kelly Bushing
Drilling Measured From: Kelly Bushing
Elev.: 268.20
K.B. 273.40 m
G.L. 268.20 m
D.F. 273.10 m
above Perm.DatumAPI Serial No.
EL470
Longitude:
126° 59' 58" W
Latitude:
65° 5' 27" N

Logging Date 14-Jan-2014

Run Number 1.1

Depth Driller 1908.00 m

Schlumberger Depth 1819.10 m

Bottom Log Interval 1813.63 m

Top Log Interval 0.00 m

Casing Driller Size @ Depth 244.5 mm @ 603.00 m

Casing Schlumberger 603 m

Bit Size 222 mm

Type Fluid In Hole INVERT

Density 1025 kg/m3

Viscosity 75 s

Fluid Loss PH

Source of Sample

RM @ Meas Temp N/A

RMF @ Meas Temp N/A

RMC @ Meas Temp N/A

Source RMF N/A

RM @ BHT N/A

RMF @ BHT N/A

Max Recorded Temperatures 71.5 degC

Circulation Stopped 14-Jan-2014 07:20:00

Logger on Bottom 14-Jan-2014 18:25:00

Unit Number 3139

Location: JEFFREY TATLOCK

Recorded By DAVID LAWRENCE

Witnessed By

Disclaimer

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8.5 Parameter Listing

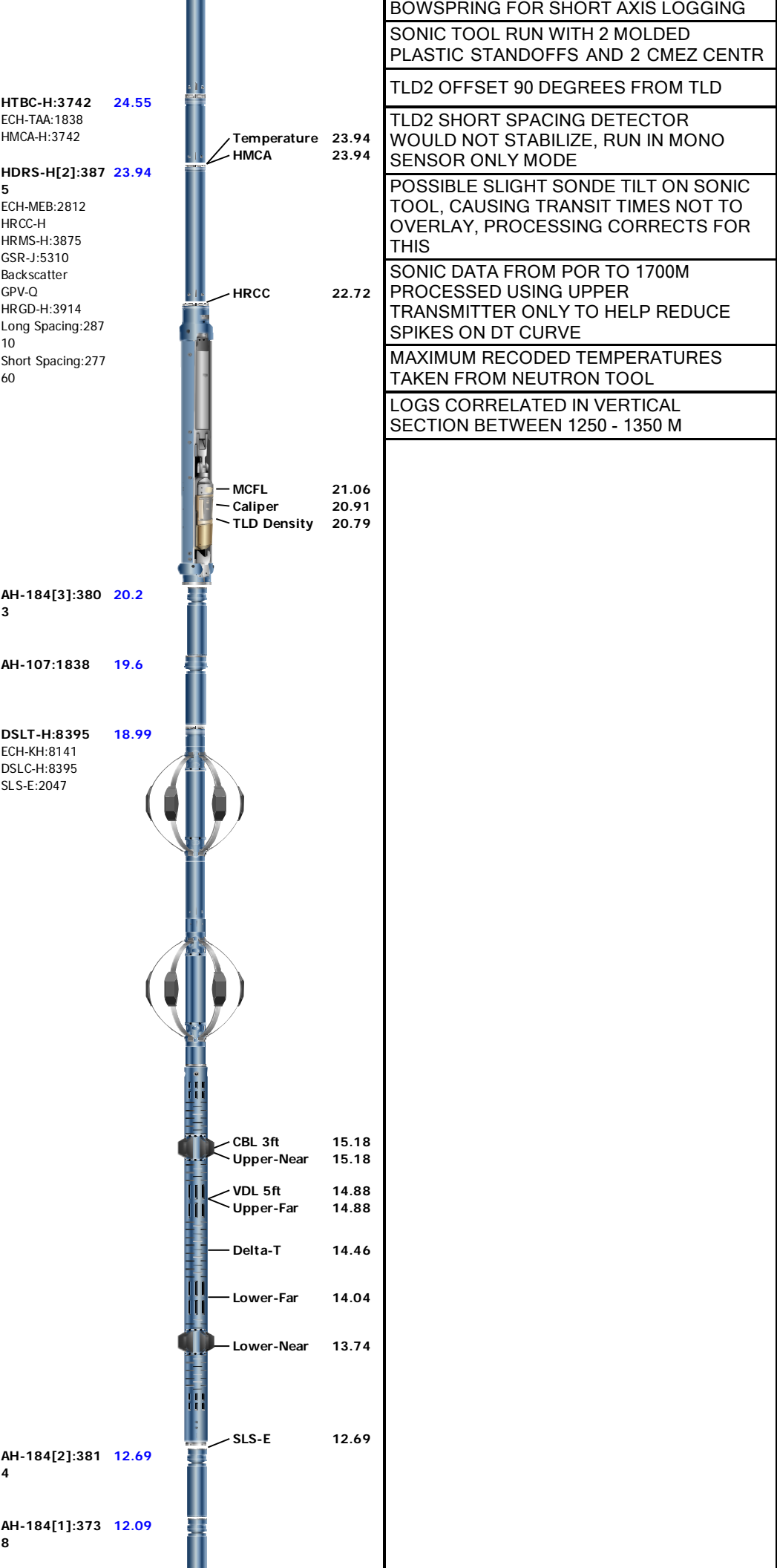
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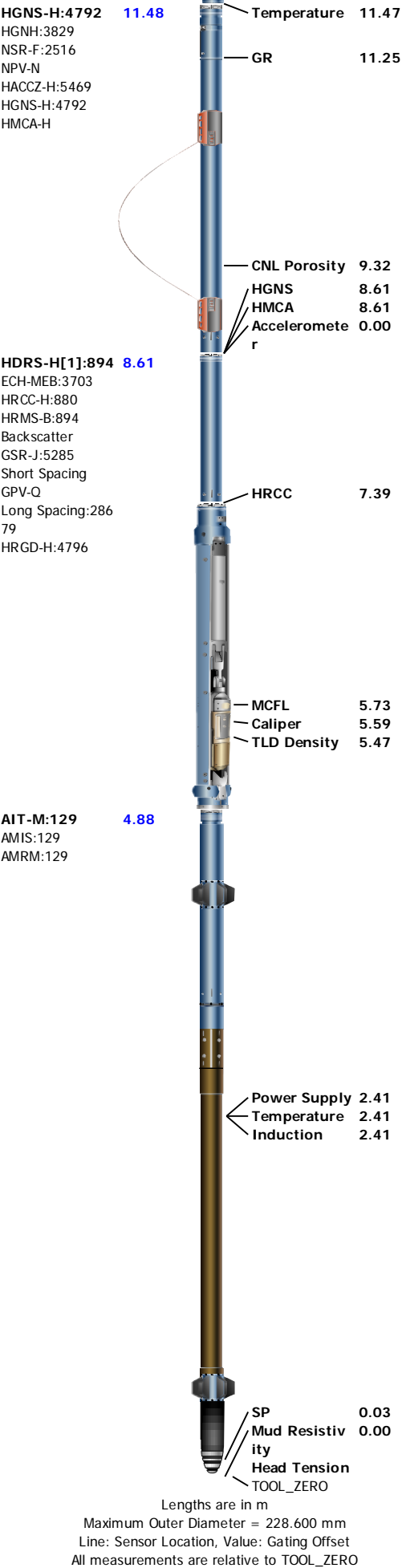
Borehole Fluids

| | | | | | | |
|------------------------------------|-------------------------|--|--|--|--|--|
| Parameter(unit) | 1.1 | | | | | |
| Fluid Type | Oil | | | | | |
| Fluid Name | INVERT | | | | | |
| Max Recorded Temperatures (degC) | 71.5 | | | | | |
| Source of Sample | N/A | | | | | |
| Salinity (ppm) | 0 | | | | | |
| Density (kg/m3) | 1025 | | | | | |
| Funnel Viscosity (s) | 75 | | | | | |
| Fluid Loss (cm3) | | | | | | |
| PH | | | | | | |
| Date/Time Circulation Stopped | 14-Jan-2014 07:20:00 | | | | | |
| Date Logger on Bottom | 14-Jan-2014 | | | | | |
| Time Logger on Bottom | 18:25:00 | | | | | |
| Source RMF | N/A | | | | | |
| RMC | N/A | | | | | |
| RM @ Meas Temp (ohm.m@degC) | N/A | | | | | |
| RMF @ Meas Temp (ohm.m@degC) | N/A | | | | | |
| RMC @ Meas Temp (ohm.m@degC) | N/A | | | | | |
| RM @ BHT (ohm.m@degC) | N/A | | | | | |
| RMF @ BHT (ohm.m@degC) | N/A | | | | | |
| RMC @ BHT (ohm.m@degC) | N/A | | | | | |
| Electricity Stability (V) | | | | | | |
| Oil/Water | | | | | | |
| Total Solid (%) | | | | | | |
| High Gravity Solids (%) | | | | | | |

Remarks and Equipment Summary

| 1.1: Toolstring | | | | 1.1: Remarks | | |
|--|---|---|-------------------|---|--|--|
| <div>Equip name LEH-QT:2850 LEH-QT:2850</div> <div>DTC-H:9100 ECH-KC:10172 DTC-H:9100</div> <div>SGT-N:10447 SGH-K:3210 SGC-TB:10447 SGD-TAA</div> | <div>Length 28.03</div> <div>27.14</div> <div>26.22</div> |  | MP name Offset | ALL INTERVALS AND PRESENTATIONS AS PER CLIENT REQUEST | | |
| | | | | RIG: BEAVER 2 | | |
| | | | | SLB CREW: JASON LEGASSIE | | |
| | | | | LOGGER REQUESTED AT: 10:30 14-JAN-2014 | | |
| | | | | LOGGER ARRIVED AT: 09:30 14-JAN-2014 | | |
| | | | | RIG READY AT: 15:45 14-JAN-2014 | | |
| | | | | INDUCTION TOOL RUN WITH 38.1 MM STANDOFFS IN COMPUTE MUD RESISTIVITY MODE | | |
| | | | | NEUTRON TOOL RUN WITH DUAL AXIS | | |





Depth Summary

1.1

Depth Measuring Device

| | | | | | | | | | |
|------------------------------------|--------------------------|--|----------|-----------------|---|------------------------------------|--------------|------------------|-----------------------|
| Depth Measuring Device | | | | | | | | | |
| Type | IDW-JA | | | | | | | | |
| Serial Number | 6162 | | | | | | | | |
| Calibration Date | 10-MAY-2010 | | | | | | | | |
| Calibrator Serial Number | 4 | | | | | | | | |
| Calibration Cable Type | 7-39 PLXS | | | | | | | | |
| Wheel Correction 1 | -3 | | | | | | | | |
| Wheel Correction 2 | 1 | | | | | | | | |
| Tension Device | | | | | | | | | |
| Type | CMTD-B/A | | | | | | | | |
| Serial Number | 1293 | | | | | | | | |
| Calibration Date | 06-SEP-2013 | | | | | | | | |
| Calibrator Serial Number | 1111 | | | | | | | | |
| Number of Calibration Points | 10 | | | | | | | | |
| Calibration Root Mean Square Error | 28 | | | | | | | | |
| Calibration Peak Error | 54 | | | | | | | | |
| Logging Cable | | | | | | | | | |
| Type | 7-39P-LXS | | | | | | | | |
| Serial Number | | | | | | | | | |
| Length | 3100.00 m | | | | | | | | |
| Conveyance Type | Wireline | | | | | | | | |
| Rig Type | | | | | | | | | |
| 1.1:Depth Control Parameters | | | | | Depth Control Remarks | | | | |
| Log Sequence | First Log In the Well | | | | ALL SCHLUMBERGER DEPTH CONTROL PROCEDURES FOLLOWED IDW USED AS PRIMARY DEPTH CONTROL Z-CHART USED AS SECONDARY DEPTH CONTROL ALL LOGS CORRELATED TO DOWN LOG IN VERTICAL SECTION BETWEEN 1250 - 1350 M | | | | |
| Rig Up Length At Surface | 56.06 m | | | | | | | | |
| Rig Up Length At Bottom | 56.02 m | | | | | | | | |
| Rig Up Length Correction | 0.04 m | | | | | | | | |
| Stretch Correction | 1.27 m | | | | | | | | |
| Tool Zero Check At Surface | 0.30 m | | | | | | | | |
| 1.1 | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Integration Summary | | | | | | | | | |
| Output Channel(s) | Output Description | | | Input Parameter | | | Output Value | Unit | |
| IHV | Integrated Hole Volume | | | HVCS | | | 47.16 | m3 | |
| ICV | Integrated Cement Volume | | | HVCS, FCD | | | 16.92 | m3 | |
| Software Version | | | | | | | | | |
| Acquisition System | | | | | | Version | | | |
| MaxWell | | | | | | 4.0.9163.3000 | | | |
| Application Patch | | | | | | Patch-SP-10767_13075-4.0.9163.3001 | | | |
| Computation | | Description | | | | | | Version | |
| Borehole | | Borehole Ensemble provides common Borehole Parameters and Channels | | | | | | 4.0.9213.3000 | |
| DepthCorrection | | DepthCorrection | | | | | | 4.0.9213.3000 | |
| Tool Elements | | Description | | | | Software Version | | Firmware Version | |
| HRCC-H | | HILT High-Resolution Control Cartridge, 150 degC | | | | 4.0.9231.3000 | | 2.0 | |
| HRGD-H | | HILT Resistivity Gamma-Ray Density Device, 150 degC | | | | 4.0.9231.3000 | | 3.0 | |
| HGNS-H | | HILT Gamma-Ray and Neutron Sonde, 150 degC | | | | 4.0.9231.3000 | | 2.0 | |
| Pass Summary | | | | | | | | | |
| Run Name | Pass Objective | Direction | Top | Bottom | Start | Stop | DSC Mode | Depth Shift | Include Parallel Data |
| 1.1 | Log[5]:Up | Up | 543.85 m | 1822.88 m | 14-Jan-2014 6:48:20 PM | 14-Jan-2014 8:17:20 PM | ON | -1.90 m | Yes |

All depths are referenced to toolstring zero

Log

Company: CONOCOPHILLIPS CANADA RESOURCES CORP.

Well: COPRC DODO CANYON E76

1.1: Log[5]:Up:S023

Description: MCFL processing LOC for Platform Express Format: Log (DENSITY-600) Index Scale: 1:600 Index Unit: m Index Type: Measured Depth
Creation Date: 15-Jan-2014 01:22:49

| Channel | Source | Sampling |
|-----------|-------------------------|----------|
| BS | Borehole | 6in |
| CALI.1 | HDRS-H[1]:HRCC-H:HRCC-H | 1in |
| CALI.2 | HDRS-H[2]:HRCC-H:HRCC-H | 1in |
| GR_CAL | HGNS-H:HGNS-H:HGNS-H | 6in |
| HDRA | HDRS-H[1]:HRMS-H:HRGD-H | 2in |
| ICV | Borehole | 6in |
| IHV | Borehole | 6in |
| PEFZ | HDRS-H[1]:HRMS-H:HRGD-H | 2in |
| RHOZ | HDRS-H[1]:HRMS-H:HRGD-H | 2in |
| STIT | DepthCorrection | 6in |
| TENS | WLWorkflow | 1in |
| TIME_1900 | WLWorkflow | 0.1in |

ICV - Integrated Cement Volume every 0.10 (m3)

IHV - Integrated Hole Volume every 1.00 (m3)

TIME_1900 - Time Marked every 60.00 (s)

IHV - Integrated Hole Volume every 0.10 (m3)

ICV - Integrated Cement Volume every 1.00 (m3)

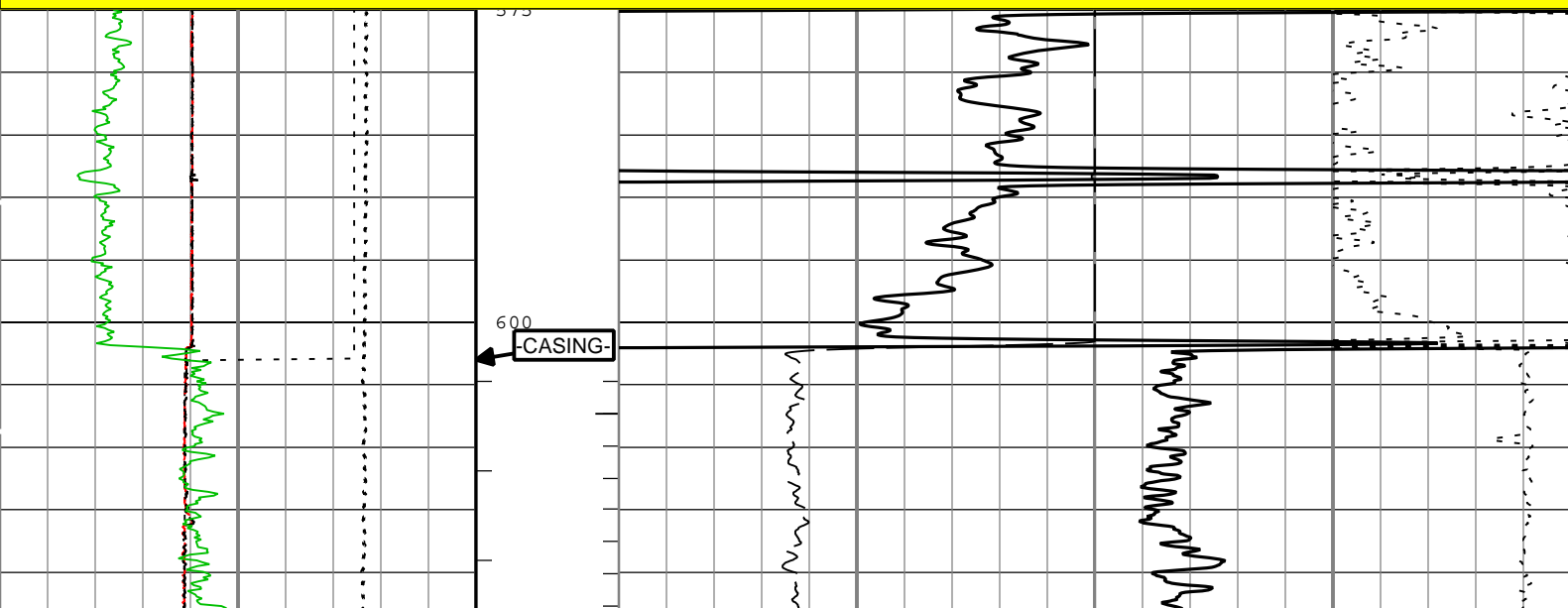
| Cable Tension (TENS) | | |
|----------------------|---|---|
| 25000 | N | 0 |

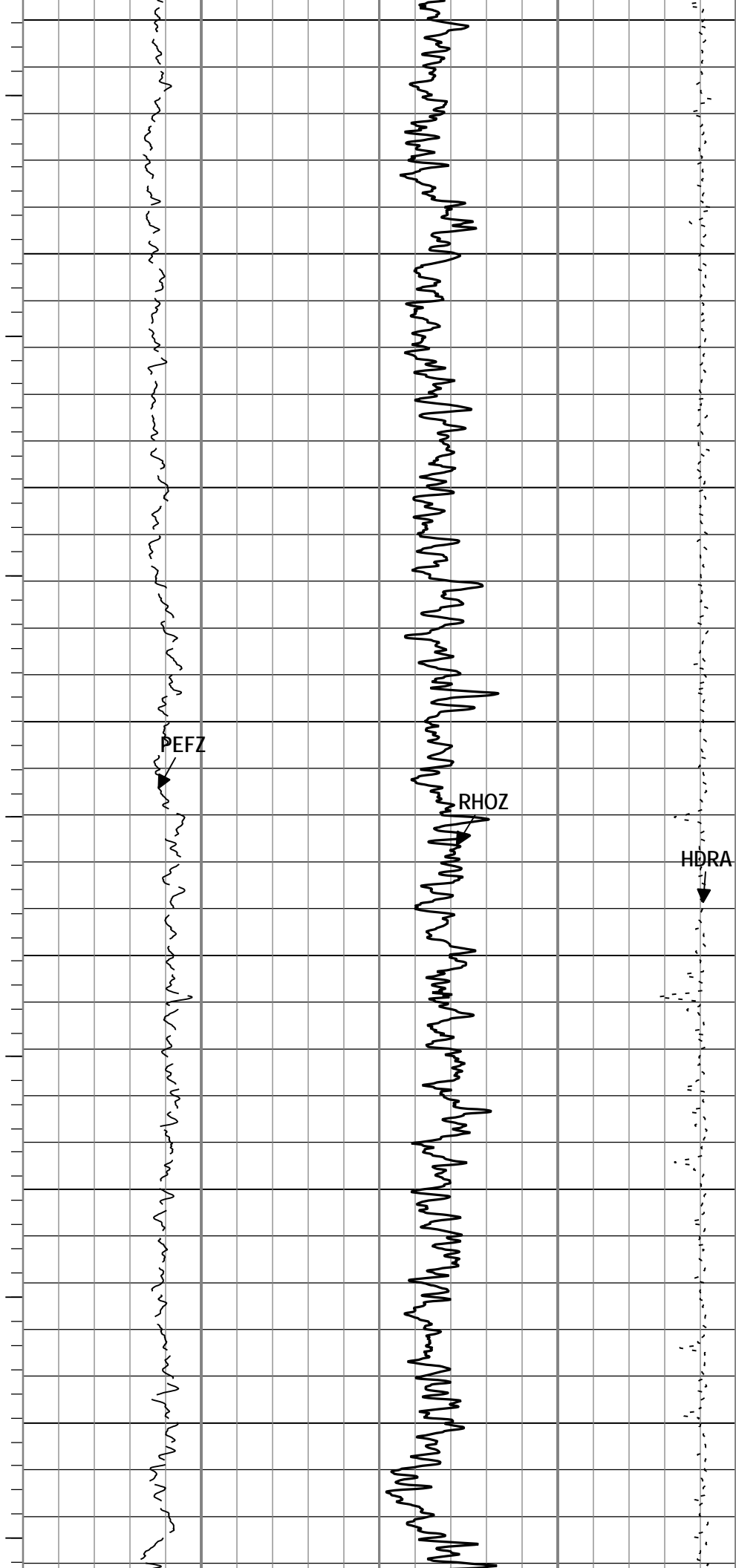
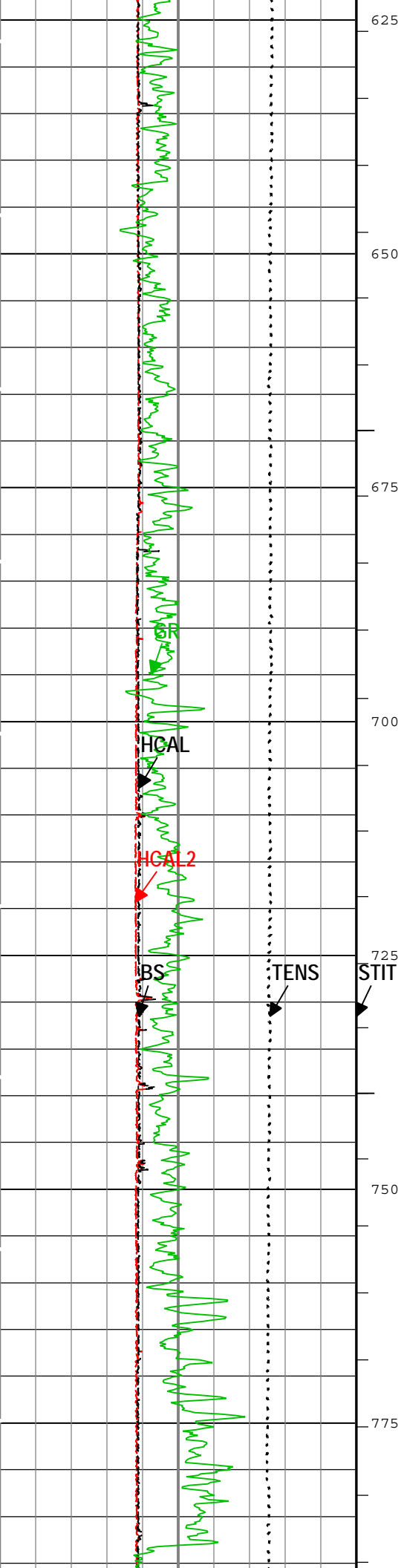
| Bit Size (BS) | | |
|---------------|------|-----|
| 125 | mm | 375 |
| HCAL2 | | |
| 125 | mm | 375 |
| HCAL | | |
| 125 | mm | 375 |
| GR | | |
| 0 | gAPI | 300 |

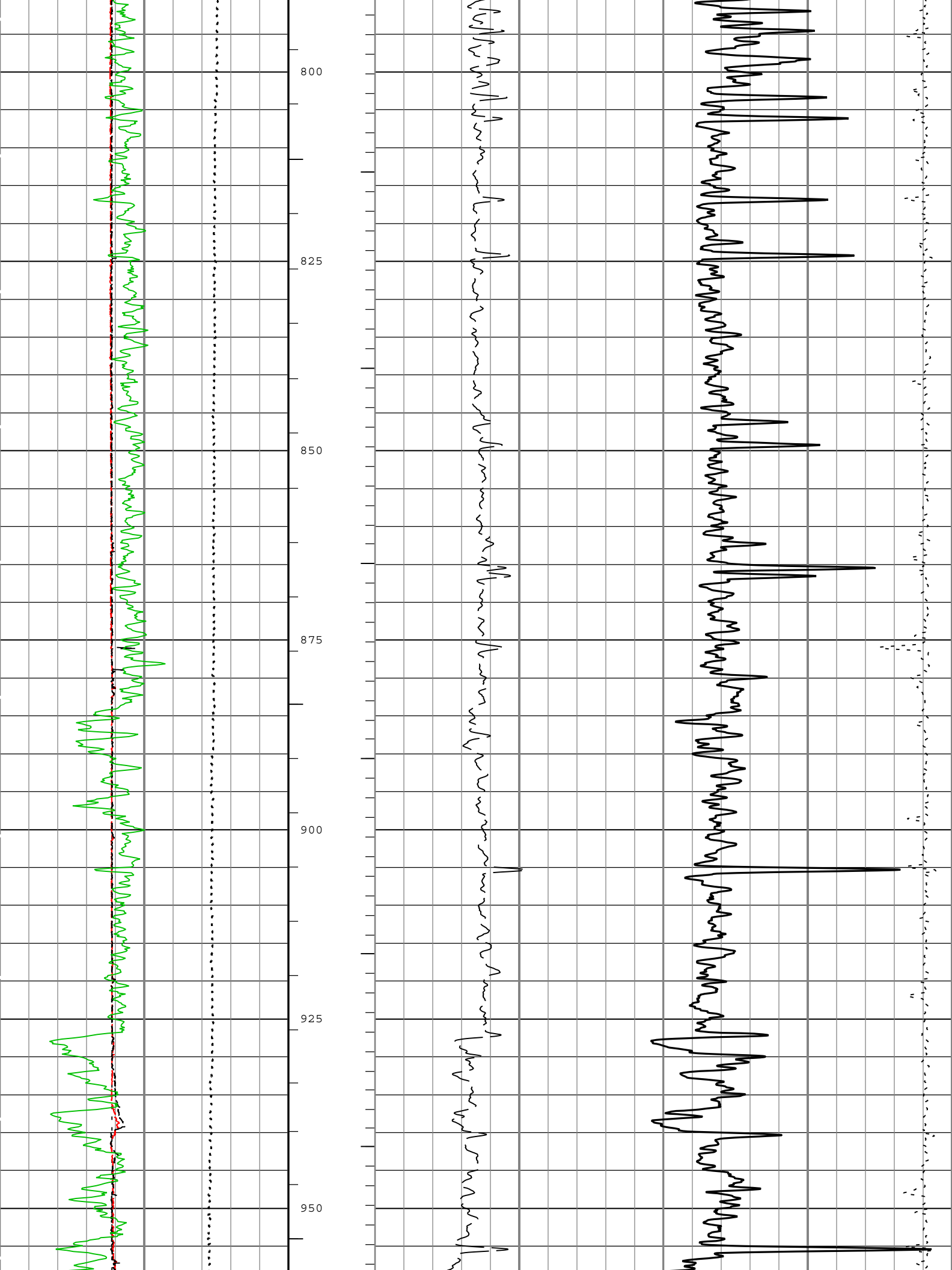
| Density Standoff Correction (HDRA) HDRS-H[1] | | |
|--|-------|-----|
| 200 | kg/m3 | -50 |

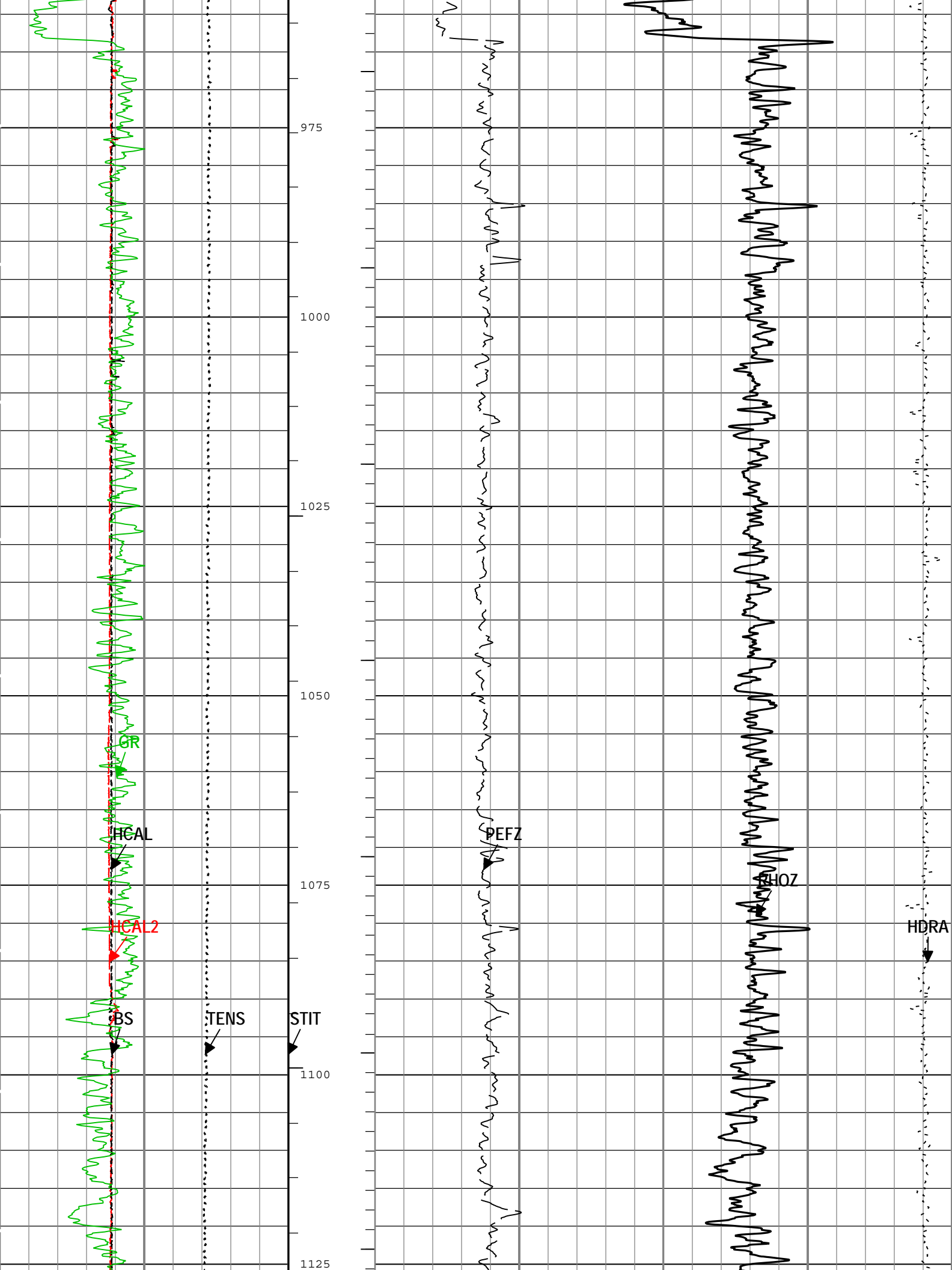
| Standard Resolution Formation Density (RHOZ) HDRS-H[1] | | |
|---|-------|------|
| 2000 | kg/m3 | 3000 |
| Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H[1] | | |
| 0 | | 20 |

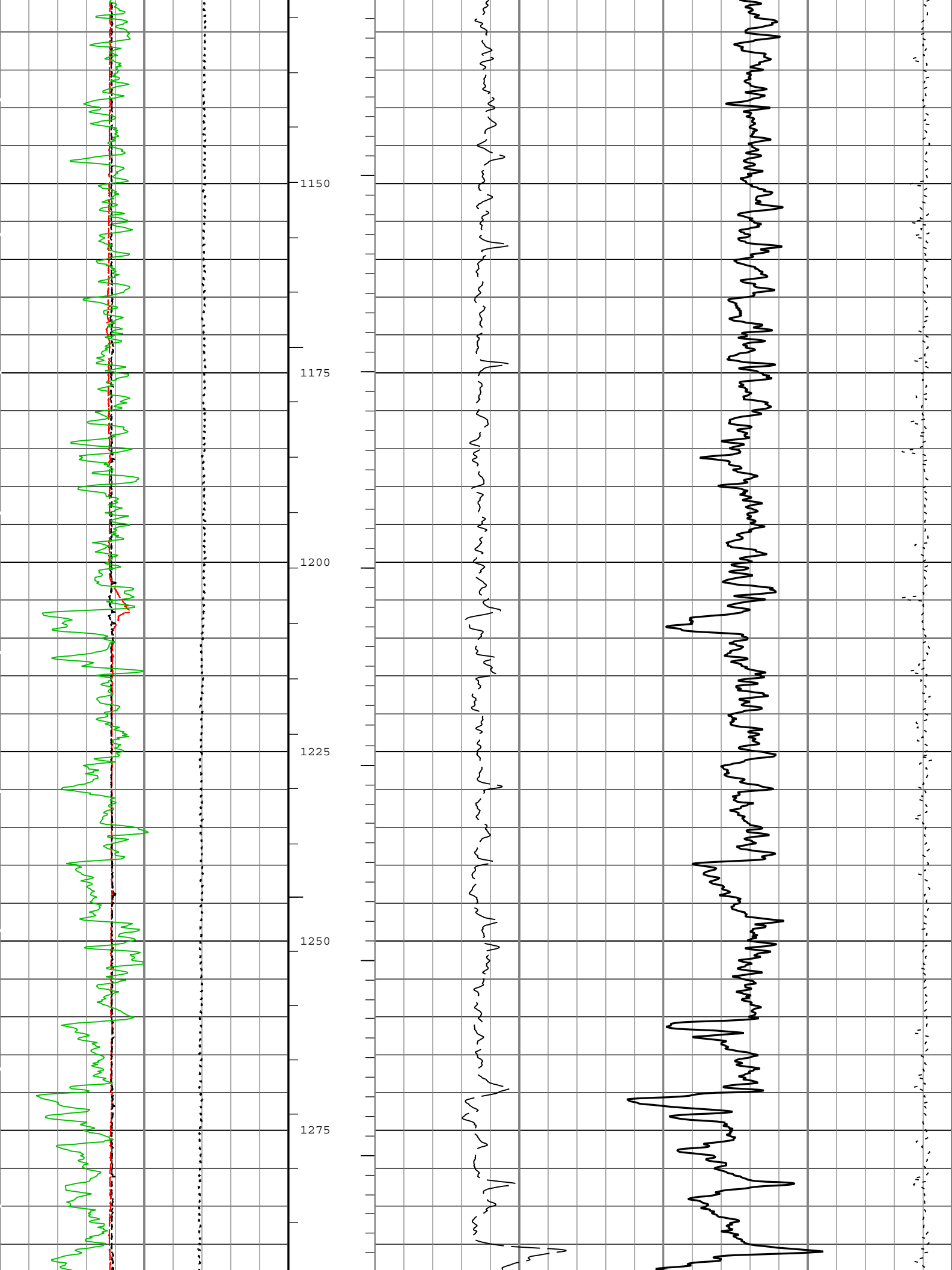
MAIN PASS: PEX-FORMATION BULK DENSITY LOG

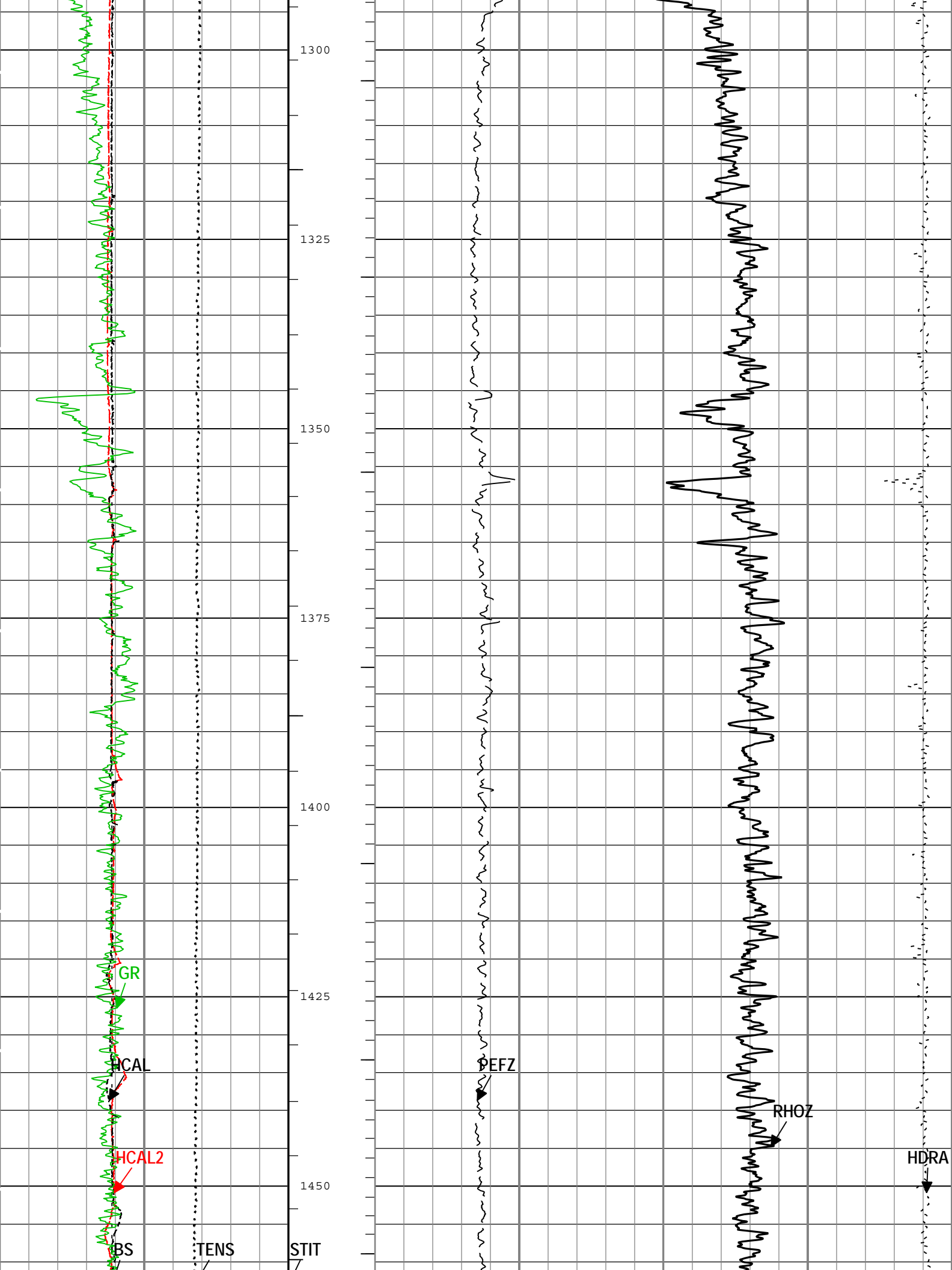


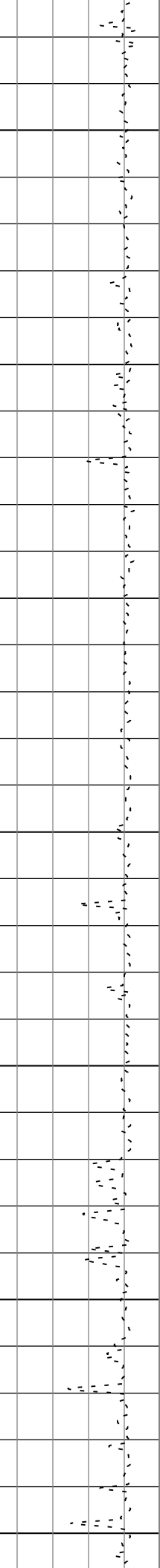
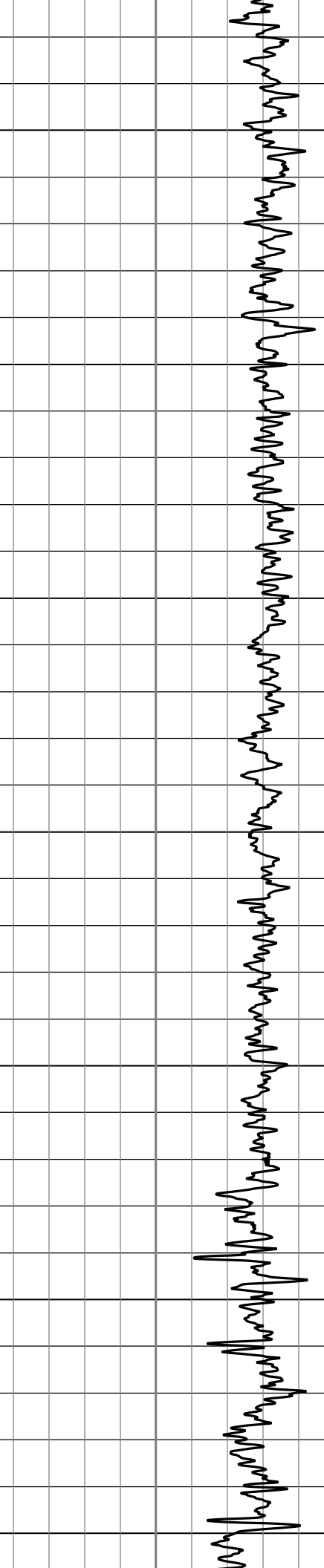
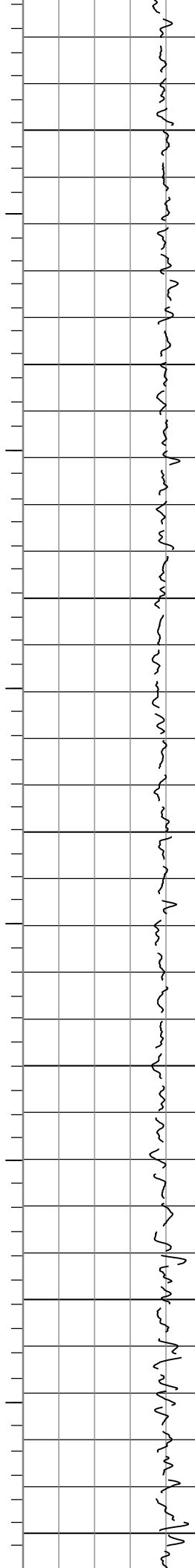
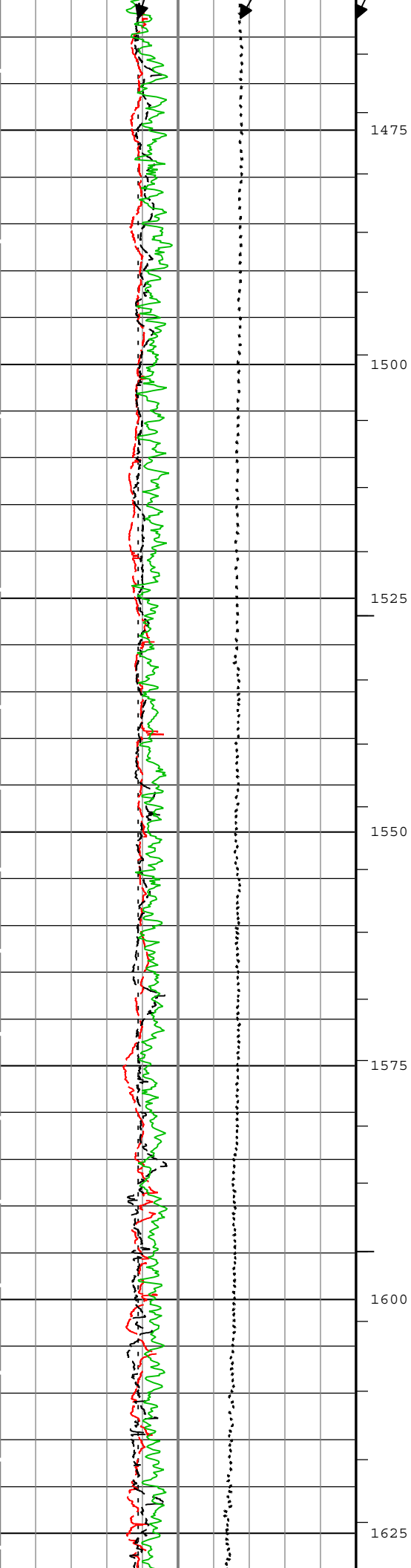


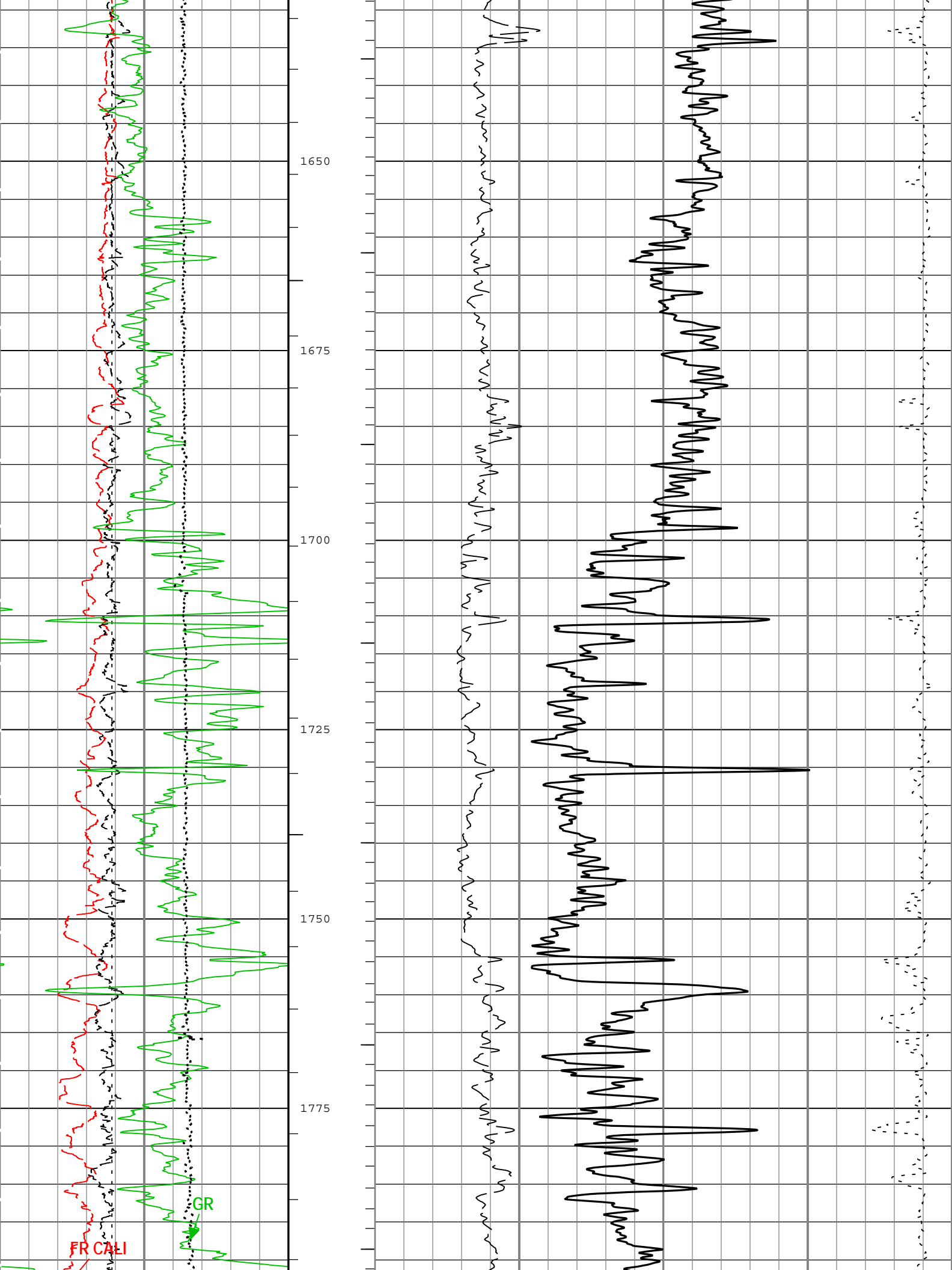


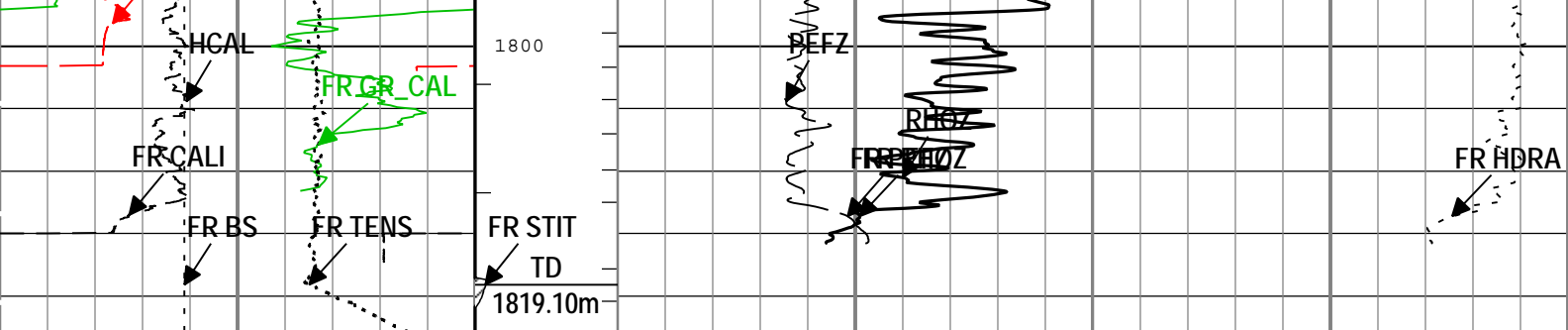












MAIN PASS: PEX-FORMATION BULK DENSITY LOG

| Bit Size (BS) | | |
|---------------|------|----------------------|
| 125 | mm | 375 |
| HCAL2 | | |
| 125 | mm | 375 |
| HCAL | | |
| 125 | mm | 375 |
| GR | | |
| 0 | gAPI | 300 |
| | | Cable Tension (TENS) |
| | | 25000 N 0 |

| Standard Resolution Formation Density (RHOZ) HDRS-H[1] | | |
|---|-------|--|
| 2000 | kg/m3 | 3000 |
| Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H[1] | | |
| 0 | | 20 |
| | | Density Standoff Correction (HDRA) HDRS-H[1] |
| | | 200 kg/m3 -50 |

└─ ICV - Integrated Cement Volume every 1.00 (m3)

└─ IHV - Integrated Hole Volume every 0.10 (m3)

TIME_1900 - Time Marked every 60.00 (s)

└─ IHV - Integrated Hole Volume every 1.00 (m3)

└─ ICV - Integrated Cement Volume every 0.10 (m3)

Description: MCFL processing LOC for Platform Express Format: Log (DENSITY-600) Index Scale: 1:600 Index Unit: m Index Type: Measured Depth
Creation Date: 15-Jan-2014 01:22:49

Channel Processing Parameters

| Parameter | Description | Tool | Value | Unit |
|----------------|--|-----------------|-----------------------|-------|
| BARI | Barite Mud Presence Flag | Borehole | No | |
| BHS | Borehole Status (Open or Cased Hole) | Borehole | Depth Zoned | |
| BS | Bit Size | WLSESSION | Depth Zoned | mm |
| CALI_SHIFT.1 | CALI Supplementary Offset | HDRS-H | 4.4 | mm |
| CALI_SHIFT.2 | CALI Supplementary Offset | HDRS-H | 13.5 | mm |
| CBLO | Casing Bottom (Logger) | WLSESSION | 603 | m |
| CSODDRL | Casing Outer Diameter - Zoned along driller depths | WLSESSION | 244.5 | mm |
| DC_MODE | Depth Correction Mode | DepthCorrection | Real-time | |
| DFD | Drilling Fluid Density | Borehole | 1025 | kg/m3 |
| DFT | Drilling Fluid Type | Borehole | Oil | |
| DHC | Density Hole Correction | HDRS-H | Bit Size | |
| FCD | Future Casing (Outer) Diameter | WLSESSION | 177.8 | mm |
| GCSE_DOWN_PASS | Generalized Caliper Selection for WL Log Down Passes | Borehole | BS | |
| GCSE_UP_PASS | Generalized Caliper Selection for WL Log Up Passes | Borehole | Depth Zoned | |
| HVCS | Integrated Hole Volume Caliper Selection | Borehole | Compute Area from GHD | |
| NPRM | HRDD Nuclear Processing Mode | HDRS-H | High Resolution | |
| TD | Total Measured Depth | Borehole | 1819.1 | m |

Depth Zone Parameters

| Parameter | Value | Start (m) | Stop (m) |
|-----------|-------|-------------|------------|
| BHS | Cased | 575 | 603 |

| | | | |
|--------------|------|-----|---------|
| BHS | Open | 603 | 1822.88 |
| BS | 311 | 575 | 603 |
| BS | 222 | 603 | 1819.1 |
| GCSE_UP_PASS | BS | 575 | 603 |
| GCSE_UP_PASS | CALI | 603 | 1822.88 |

All depth are actual.

| Tool Control Parameters | | | | |
|-------------------------|----------------------------------|-----------|----------|------|
| Parameter | Description | Tool | Value | Unit |
| HRGD_BRD_TYPE | HRGD Board Type | HDRS-H | WITH_HET | |
| MAX_LOG_SPEED | Toolstring Maximum Logging Speed | WLSESSION | 548.64 | m/h |

| Integration Summary | | | | |
|---------------------|--------------------------|-----------------|--------------|------|
| Output Channel(s) | Output Description | Input Parameter | Output Value | Unit |
| ICV | Integrated Cement Volume | HVCS, FCD | 0 | m3 |
| IHV | Integrated Hole Volume | HVCS | 0.11 | m3 |

| Software Version | | | |
|--------------------|---|------------------------------------|------------------|
| Acquisition System | | Version | |
| MaxWell | | 4.0.9163.3000 | |
| Application Patch | | Patch-SP-10767_13075-4.0.9163.3001 | |
| Computation | Description | | Version |
| Borehole | Borehole Ensemble provides common Borehole Parameters and Channels | | 4.0.9213.3000 |
| HENVIR | Computation Ensemble for the HGNS Neutron environmental corrections | | 4.0.9033.3000 |
| DepthCorrection | DepthCorrection | | 4.0.9213.3000 |
| Tool Elements | Description | Software Version | Firmware Version |
| HGNS-H | HILT Gamma-Ray and Neutron Sonde, 150 degC | 4.0.9231.3000 | 2.0 |
| SGC-TB | Scintillation Gamma Cartridge | 4.0.9033.3000 | |

| Pass Summary | | | | | | | | | |
|--------------|----------------|-----------|---------|----------|------------------------|------------------------|----------|-------------|-----------------------|
| Run Name | Pass Objective | Direction | Top | Bottom | Start | Stop | DSC Mode | Depth Shift | Include Parallel Data |
| 1.1 | Log[6]:Up | Up | 18.86 m | 648.67 m | 14-Jan-2014 8:19:45 PM | 14-Jan-2014 8:56:23 PM | ON | -2.06 m | Yes |

All depths are referenced to toolstring zero

| | | |
|-----|---|----------------------------|
| Log | Company:CONOCOPHILLIPS CANADA RESOURCES CORP. | Well:COPRC DODO CANYON E76 |
|-----|---|----------------------------|

Description: MCFL processing LQC for Platform Express Format: Log (SURFACE-CASING) Index Scale: 1:240 Index Unit: m Index Type: Measured Depth Creation Date: 15-Jan-2014 01:22:52

| | | |
|-----------|----------------------|----------|
| Channel | Source | Sampling |
| GR_CAL | SGT-N:SGT-N:SGC-TB | 6in |
| ICV | Borehole | 6in |
| IHV | Borehole | 6in |
| NPOR_SAN | HGNS-H:HGNS-H:HGNS-H | 6in |
| STIT | DepthCorrection | 6in |
| TENS | WLWorkflow | 1in |
| TIME_1900 | WLWorkflow | 0.1in |

| |
|--|
| └─ICV - Integrated Cement Volume every 0.10 (m3) |
| └─IHV - Integrated Hole Volume every 1.00 (m3) |

—IHV - Integrated Hole Volume every 0.10 (m3)

—ICV - Integrated Cement Volume every 1.00 (m3)

TIME_1900 - Time Marked every 60.00 (s)

| Cable Tension (TENS) | | |
|----------------------|---|---|
| 25000 | N | 0 |

GR_SGTN

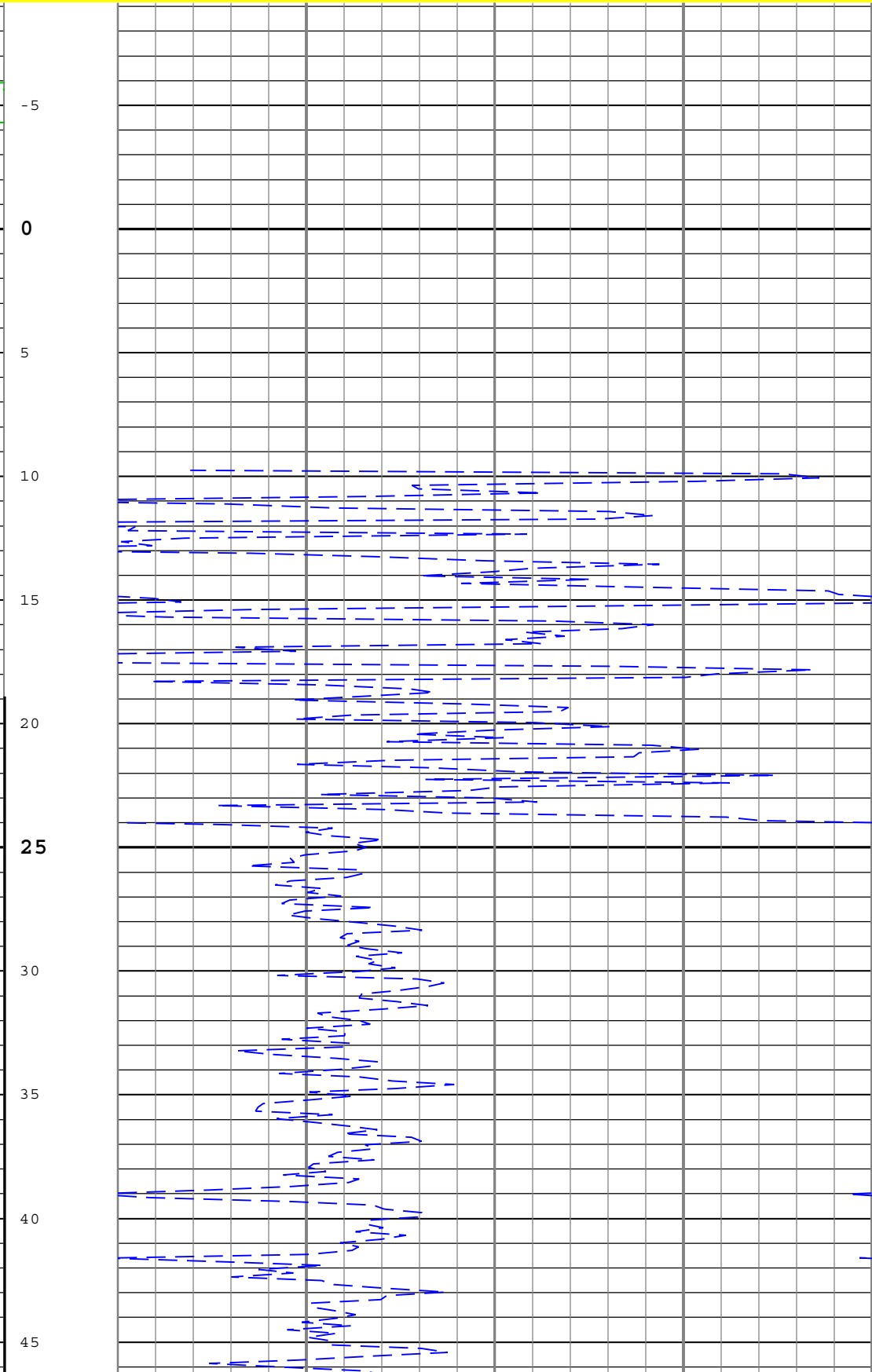
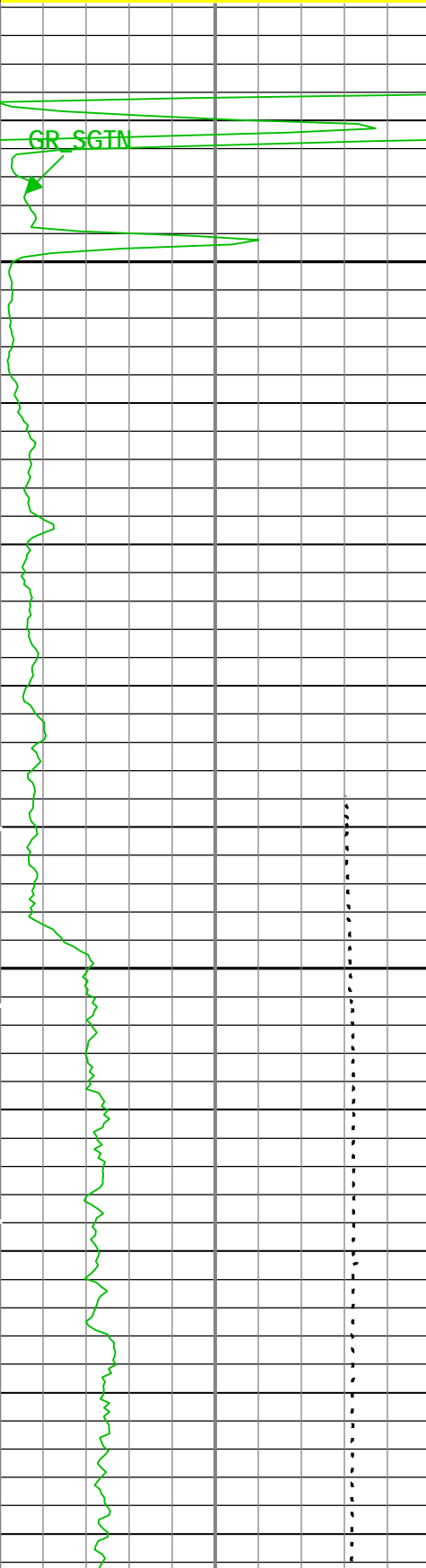
gAPI

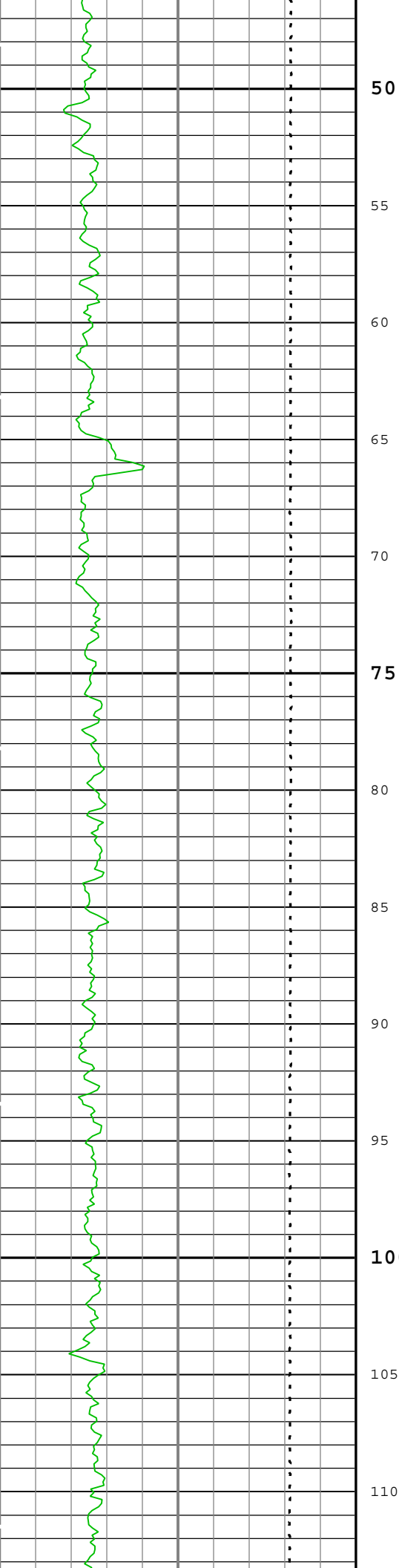
Enhanced Thermal Neutron Porosity (matrix Sandstone) (NPOR_SAN) HGNS-H

0.6

m3/m3

GR-CNL TO SURFACE, BS = SURFACE BS, BHS = CASED





50

55

60

65

70

75

80

85

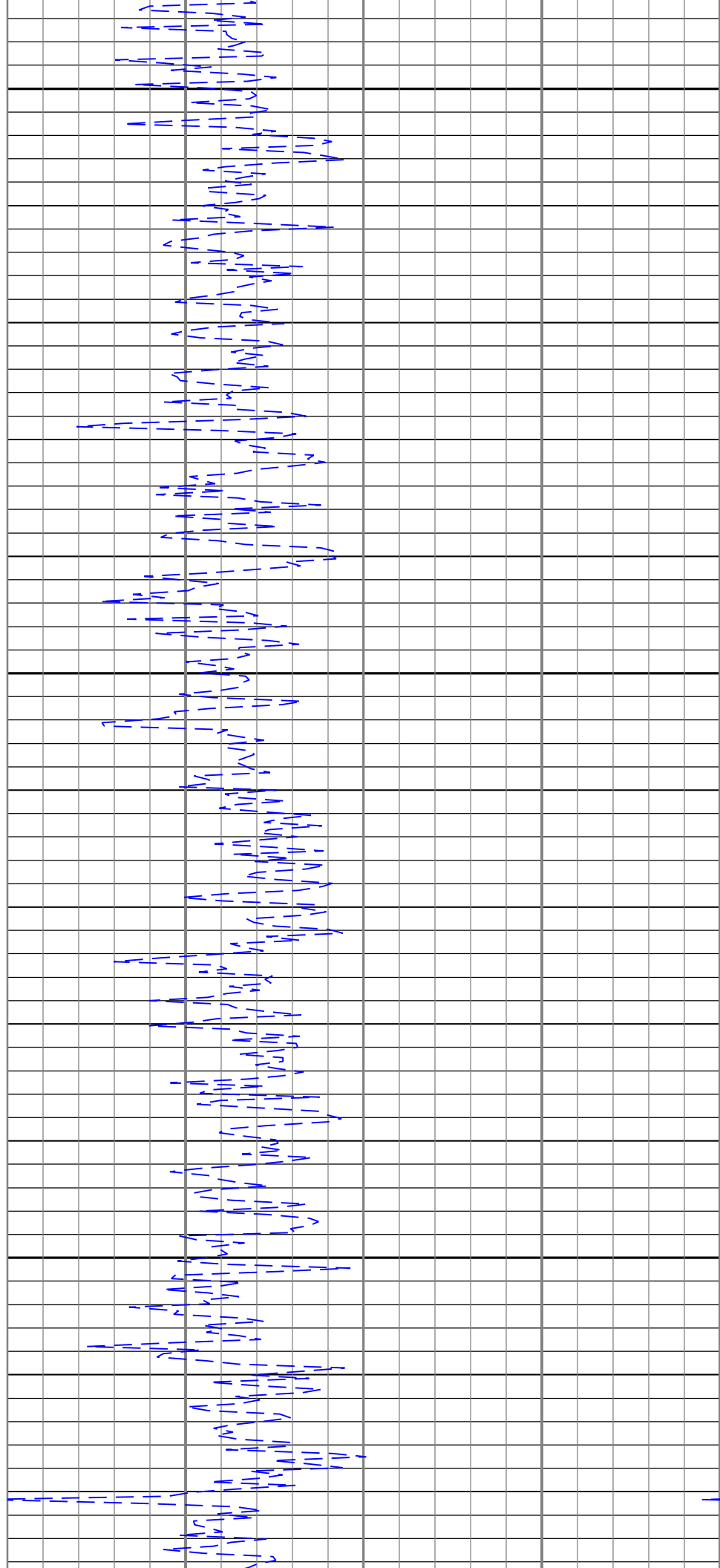
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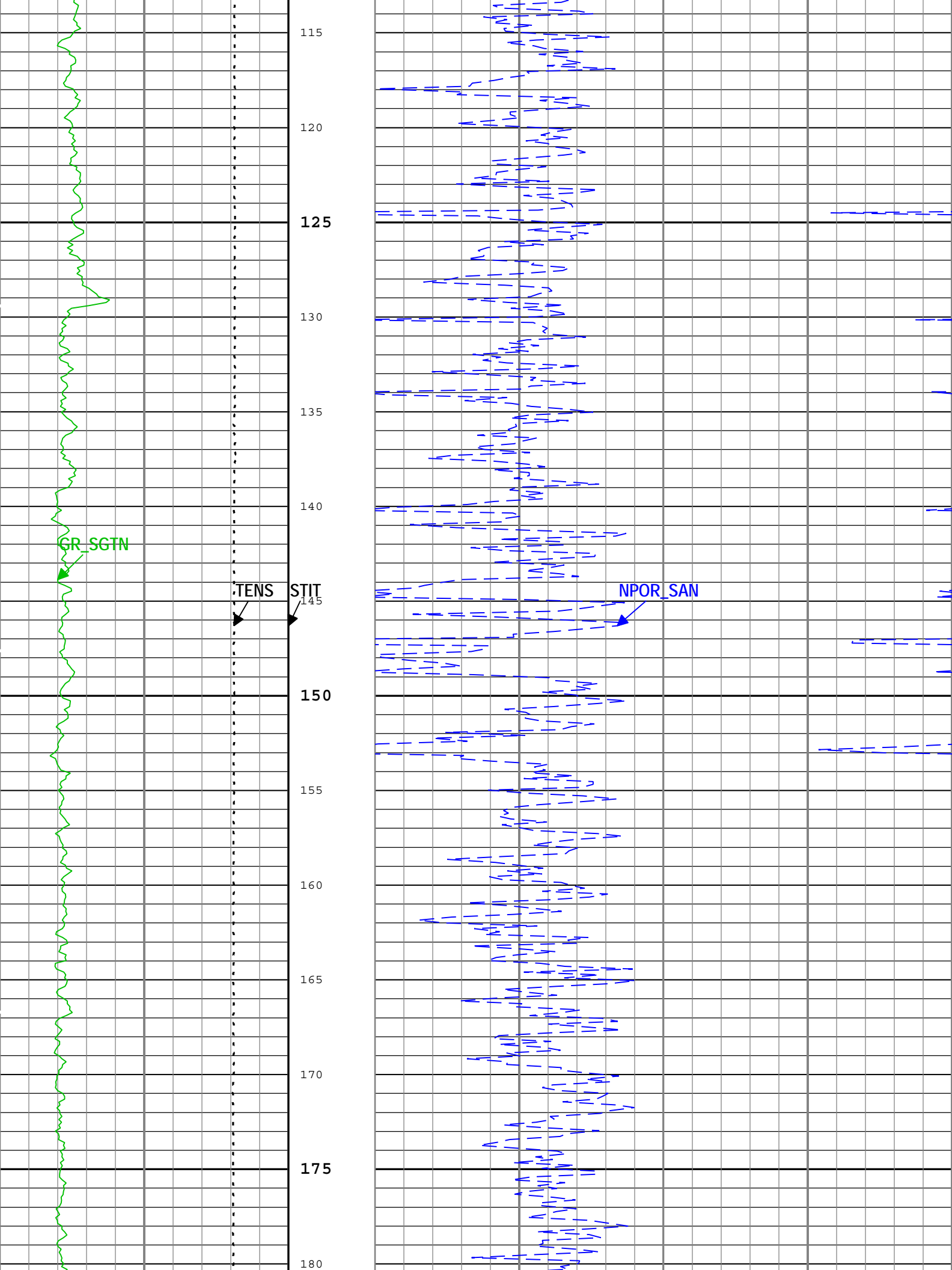
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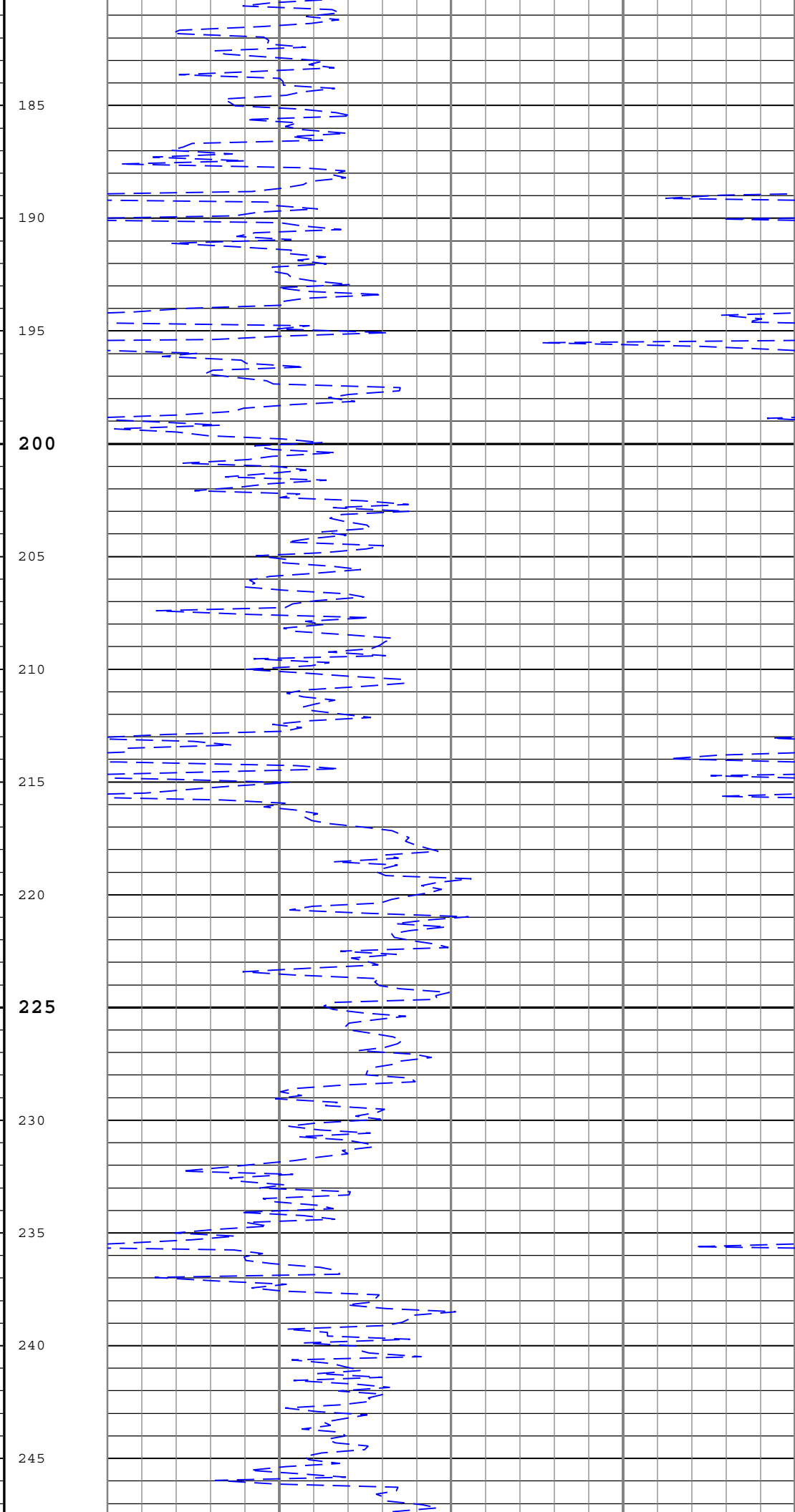
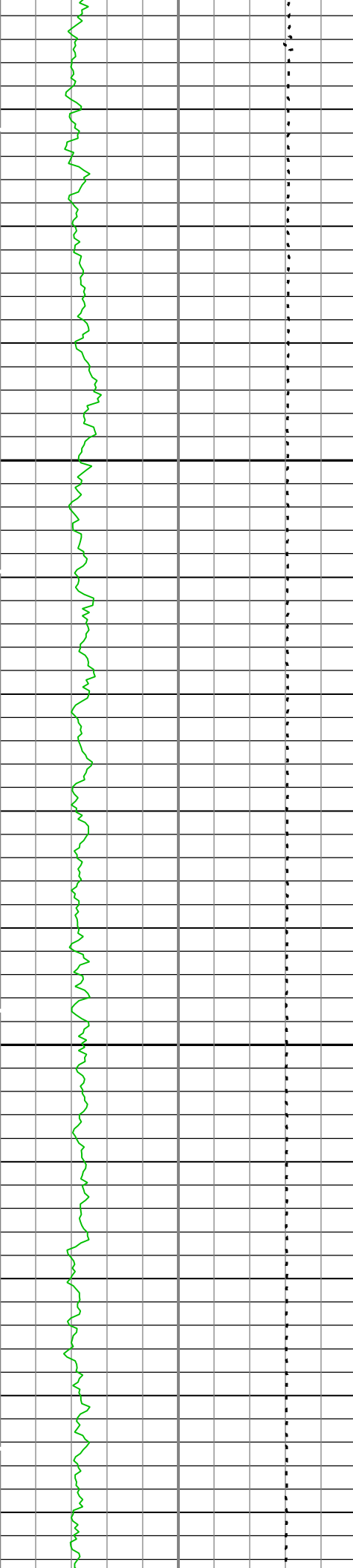
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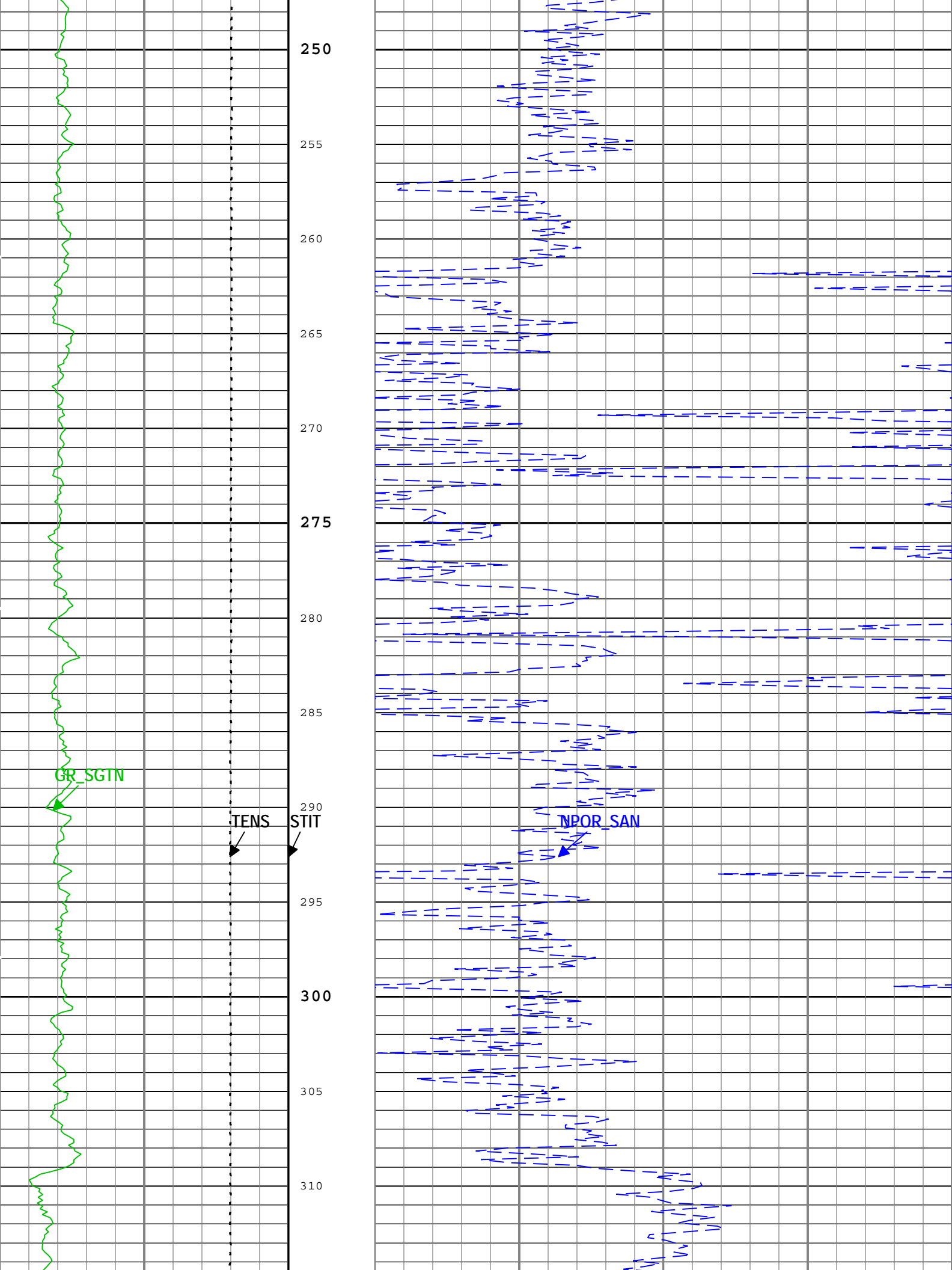
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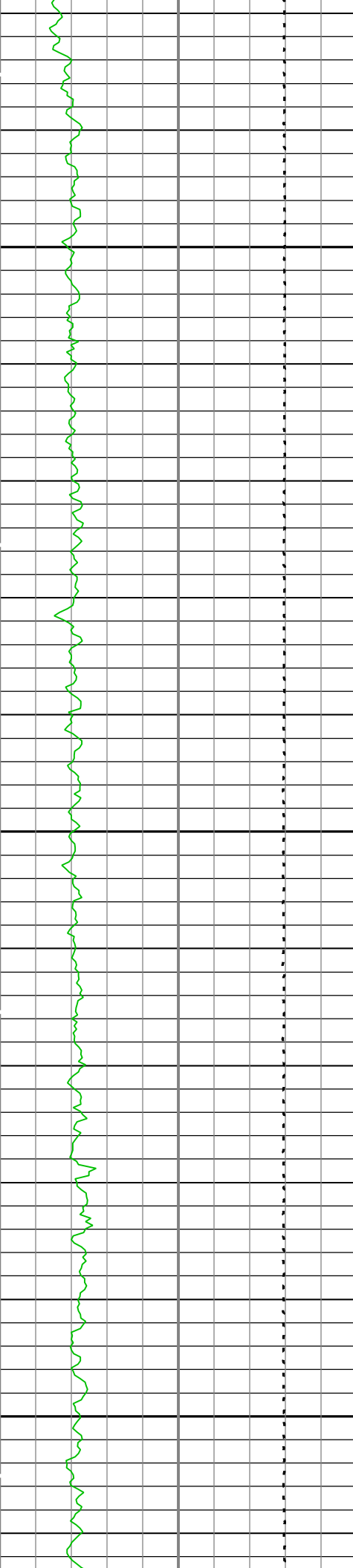
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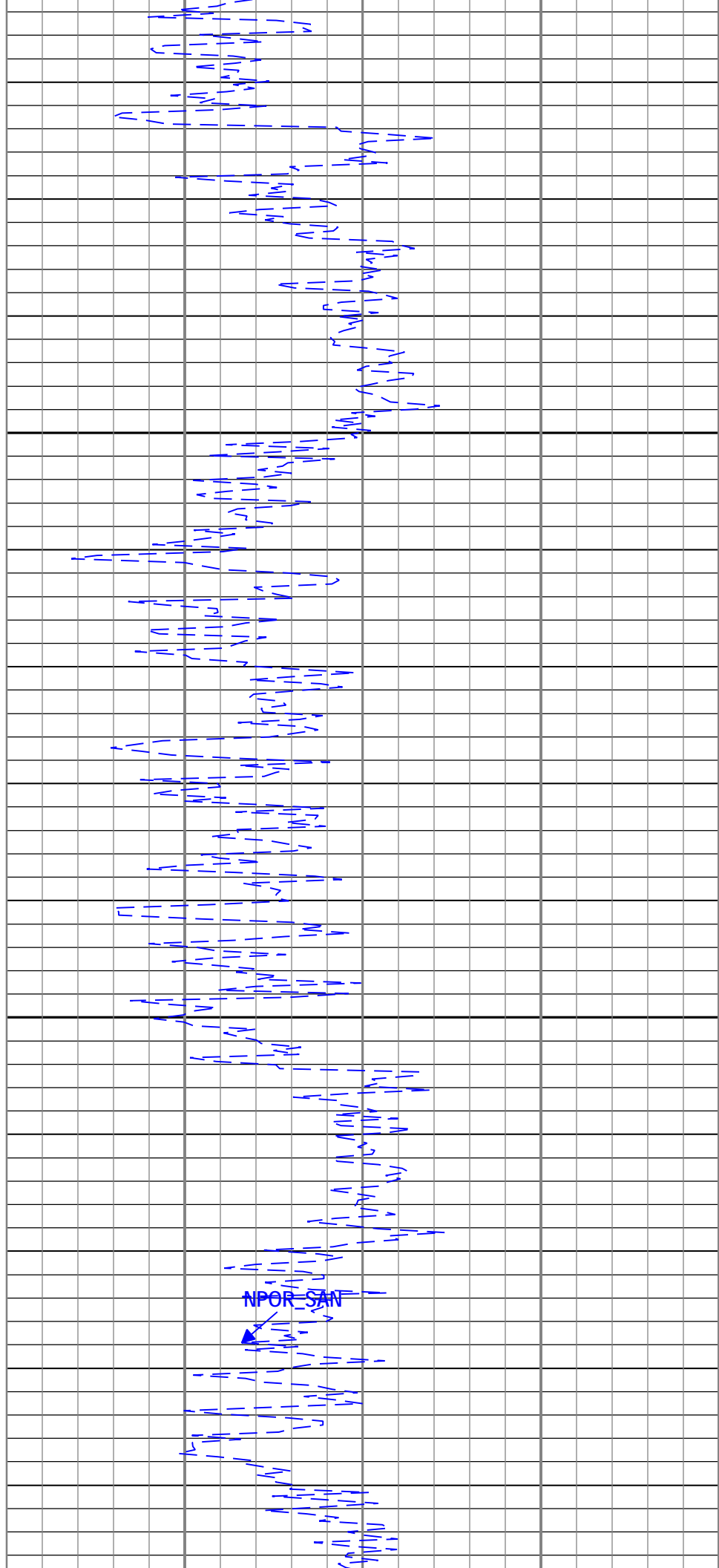
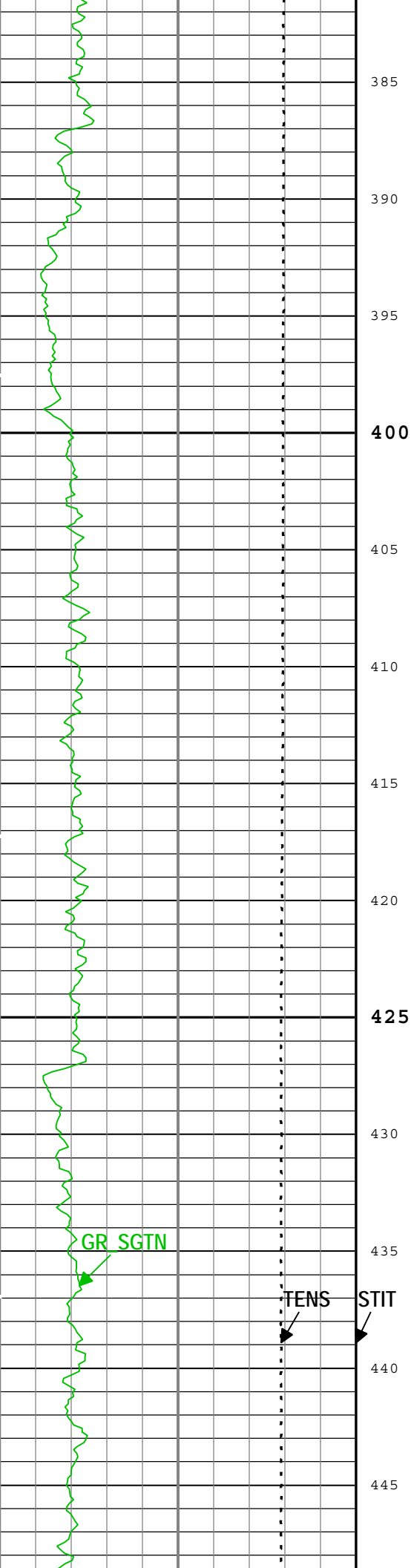


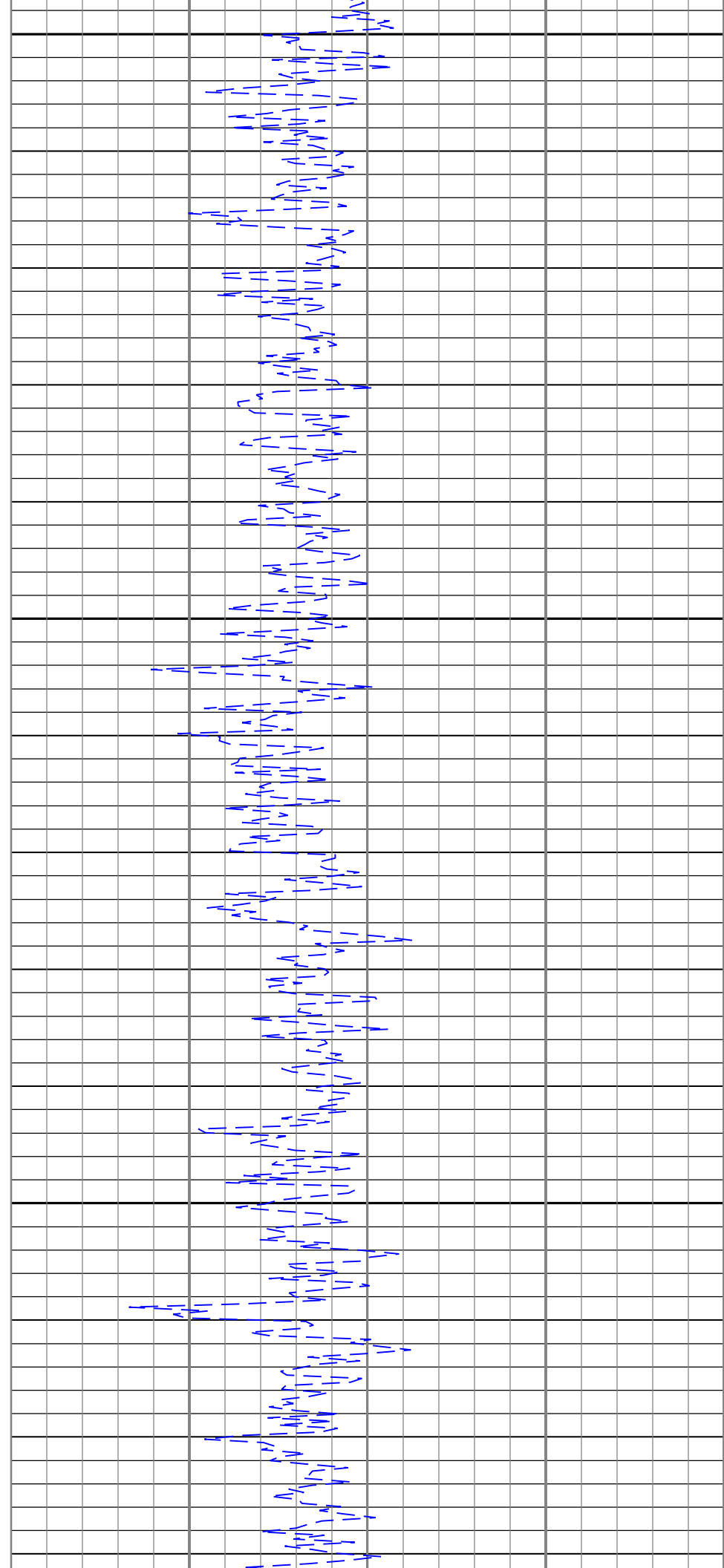
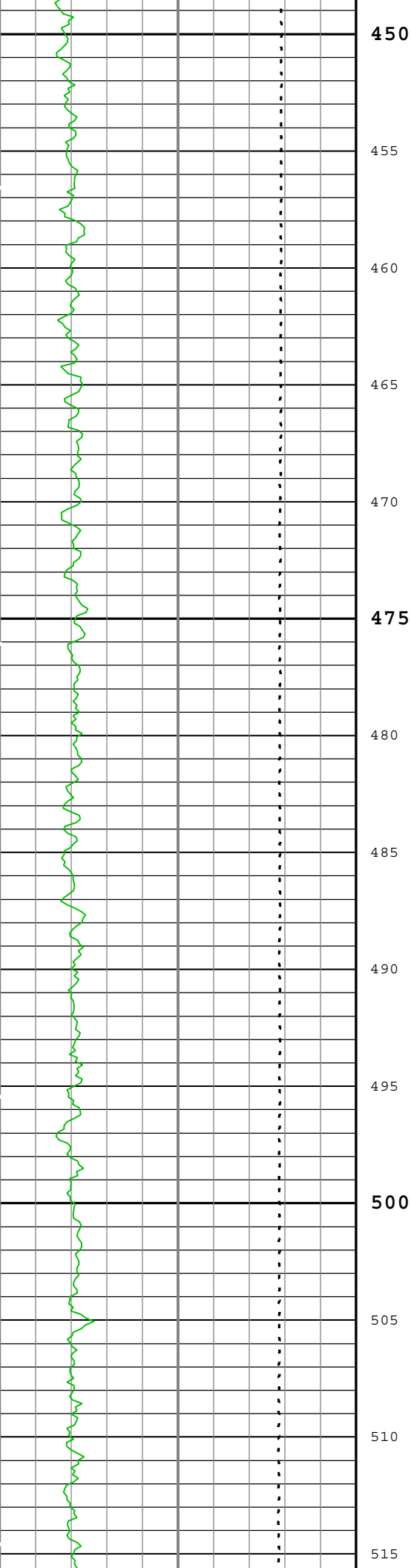


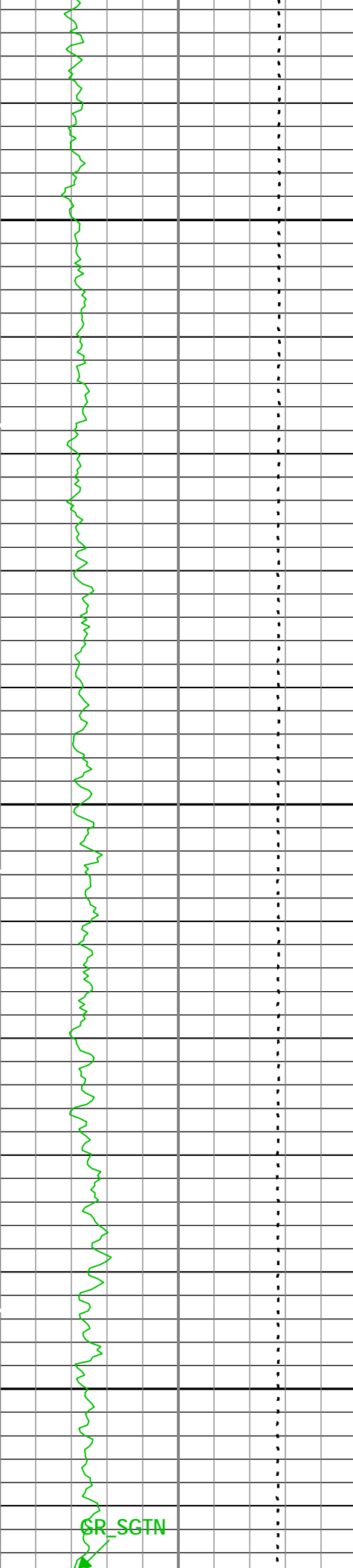


315
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380

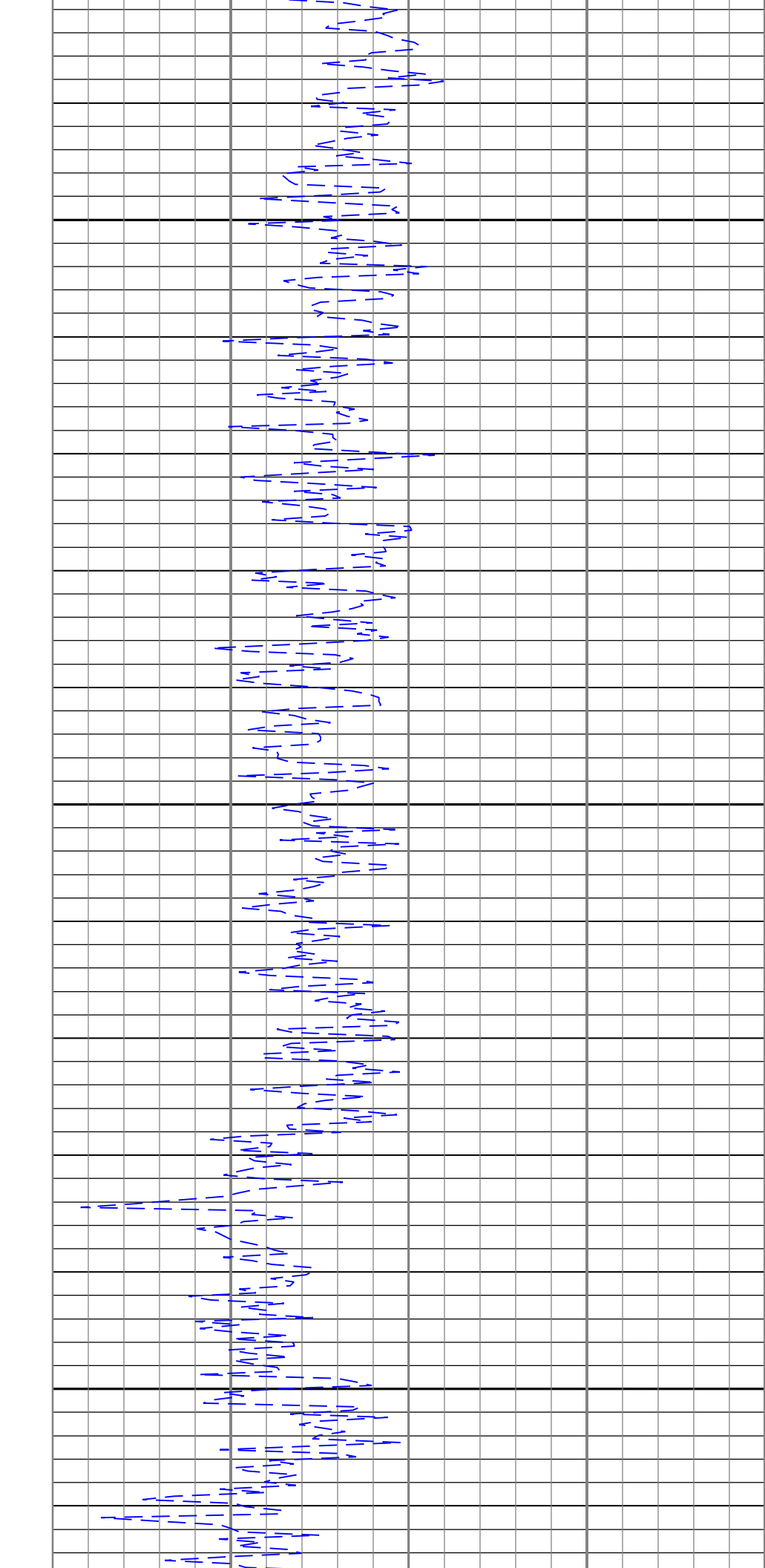




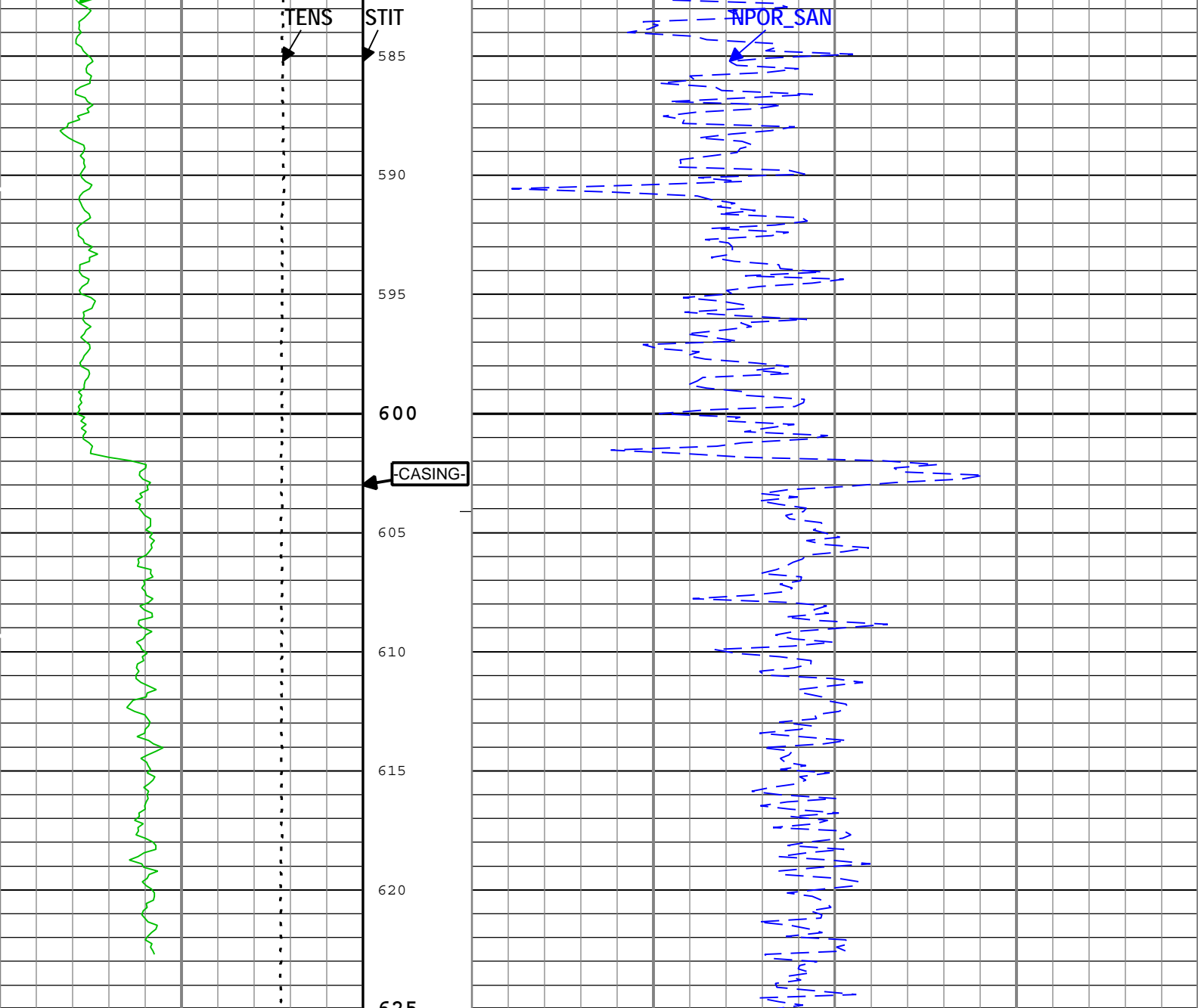




520
525
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535
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545
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555
560
565
570
575
580



SR_SGTN



GR-CNL TO SURFACE, BS = SURFACE BS, BHS = CASED

| | | | |
|---------|------|--|-------|
| GR_SGTN | | Enhanced Thermal Neutron Porosity (matrix Sandstone) (NPOR_SAN) HGNS-H | |
| 0 | gAPI | 0.6 | m3/m3 |
| 300 | | 0 | |

| | | |
|----------------------|---|---|
| Cable Tension (TENS) | | |
| 25000 | N | 0 |

TIME_1900 - Time Marked every 60.00 (s)

- ICV - Integrated Cement Volume every 1.00 (m3)
- IHV - Integrated Hole Volume every 0.10 (m3)
- IHV - Integrated Hole Volume every 1.00 (m3)
- ICV - Integrated Cement Volume every 0.10 (m3)

Description: MCFL processing LQC for Platform Express Format: Log (SURFACE-CASING) Index Scale: 1:240 Index Unit: m Index Type: Measured Depth Creation Date: 15-Jan-2014 01:22:52

Channel Processing Parameters

| Parameter | Description | Tool | Value | Unit |
|-----------|--------------------------------------|----------|-------------|------|
| BARI | Barite Mud Presence Flag | Borehole | No | |
| BHS | Borehole Status (Open or Cased Hole) | Borehole | Depth Zoned | |
| BHT | Bottom Hole Temperature | Borehole | 71.5 | degC |

| | | | | |
|----------------|--|-----------------|-----------------------|-------|
| BS | Bit Size | WLSESSION | Depth Zoned | mm |
| BSAL | Borehole Salinity | Borehole | 0 | ppm |
| CALI_SHIFT | CALI Supplementary Offset | HDRS-H | 4.4 | mm |
| CBLO | Casing Bottom (Logger) | WLSESSION | 603 | m |
| CCCO | Casing & Cement Thickness Correction Option | HGNS-H | Yes | |
| CSODDRL | Casing Outer Diameter - Zoned along driller depths | WLSESSION | 244.5 | mm |
| DC_MODE | Depth Correction Mode | DepthCorrection | Real-time | |
| DFD | Drilling Fluid Density | Borehole | 1025 | kg/m3 |
| DFT | Drilling Fluid Type | Borehole | Oil | |
| FCD | Future Casing (Outer) Diameter | WLSESSION | 177.8 | mm |
| FSAL | Formation Salinity | Borehole | 0 | ppm |
| GCSE_DOWN_PASS | Generalized Caliper Selection for WL Log Down Passes | Borehole | BS | |
| GCSE_UP_PASS | Generalized Caliper Selection for WL Log Up Passes | Borehole | Depth Zoned | |
| GRSE | Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity | Borehole | REMS | |
| GTSE | Generalized Temperature Selection, from Measured or Computed Temperature | Borehole | CTEM | |
| HSCO | Hole Size Correction Option | HGNS-H | Yes | |
| HVCS | Integrated Hole Volume Caliper Selection | Borehole | Compute Area from GHD | |
| MATR | Rock Matrix for Neutron Porosity Corrections | Borehole | SANDSTONE | |
| SOCO | Standoff Correction Option | HGNS-H | Yes | |
| TD | Total Measured Depth | Borehole | 1819.1 | m |

| Depth Zone Parameters | | | |
|-----------------------|-------|-------------|------------|
| Parameter | Value | Start (m) | Stop (m) |
| BHS | Cased | 0 | 603 |
| BHS | Open | 603 | 625 |
| BS | 311 | 0 | 603 |
| BS | 222 | 603 | 625 |
| GCSE_UP_PASS | BS | 0 | 603 |
| GCSE_UP_PASS | CALI | 603 | 625 |

All depth are actual.

| Tool Control Parameters | | | | |
|-------------------------|----------------------------------|-----------|--------|------|
| Parameter | Description | Tool | Value | Unit |
| HMCA_BRD_TYPE | HMCA Board Type | HGNS-H | 1 | |
| MAX_LOG_SPEED | Toolstring Maximum Logging Speed | WLSESSION | 548.64 | m/h |

| 1.1 | | | | |
|-----|--|--|--|--|
| | | | | |
| | | | | |

| Integration Summary | | | | |
|---------------------|--------------------------|-----------------|--------------|------|
| Output Channel(s) | Output Description | Input Parameter | Output Value | Unit |
| ICV | Integrated Cement Volume | HVCS, FCD | 16.92 | m3 |
| IHV | Integrated Hole Volume | HVCS | 47.16 | m3 |

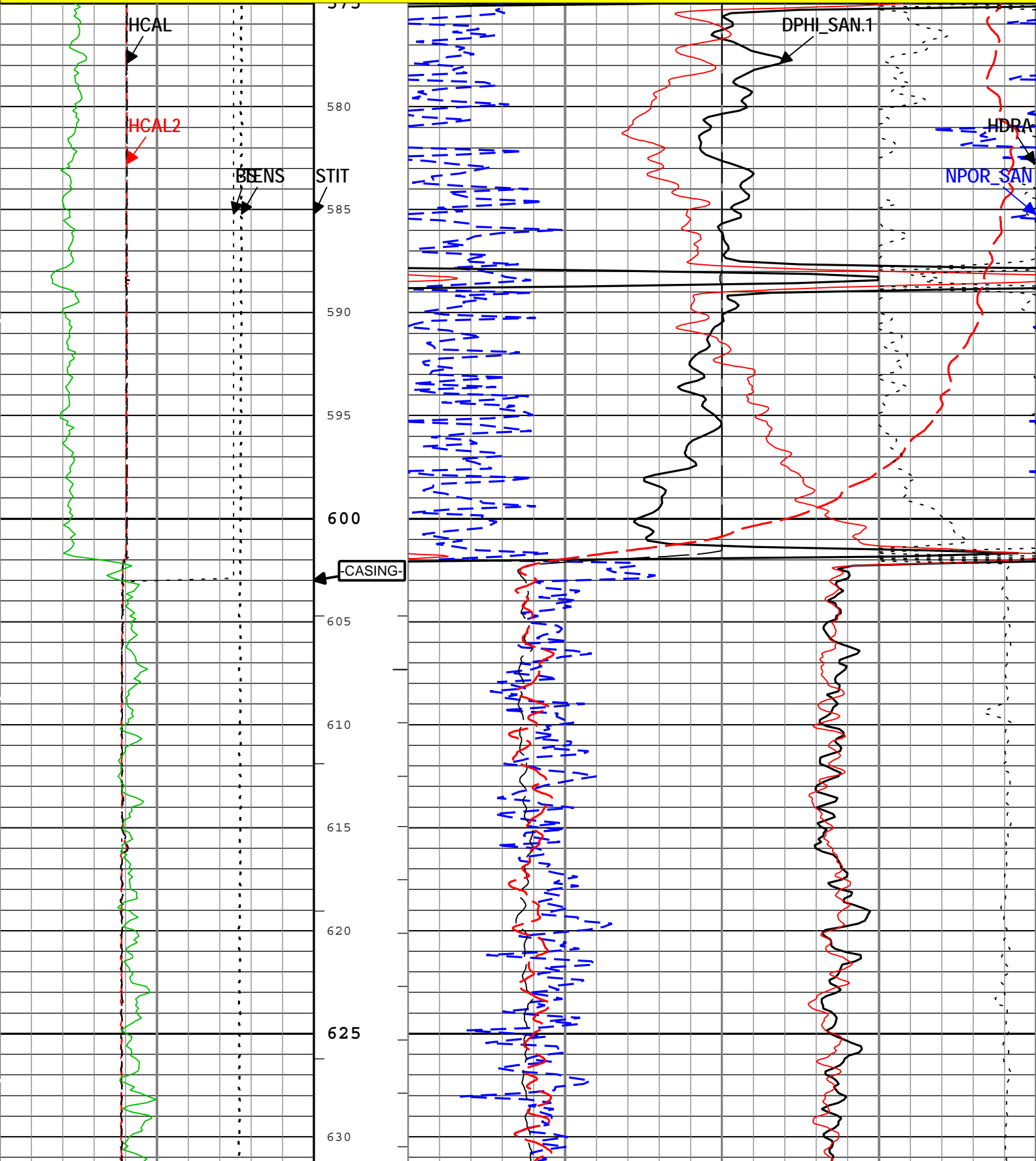
| Software Version | | | | |
|--------------------|---|------------------------------------|--|---------------|
| Acquisition System | | Version | | |
| MaxWell | | 4.0.9163.3000 | | |
| Application Patch | | Patch-SP-10767_13075-4.0.9163.3001 | | |
| Computation | Description | | | Version |
| Borehole | Borehole Ensemble provides common Borehole Parameters and Channels | | | 4.0.9213.3000 |
| HENVIR | Computation Ensemble for the HGNS Neutron environmental corrections | | | 4.0.9033.3000 |
| Depth Correction | Depth Correction | | | 4.0.9213.3000 |

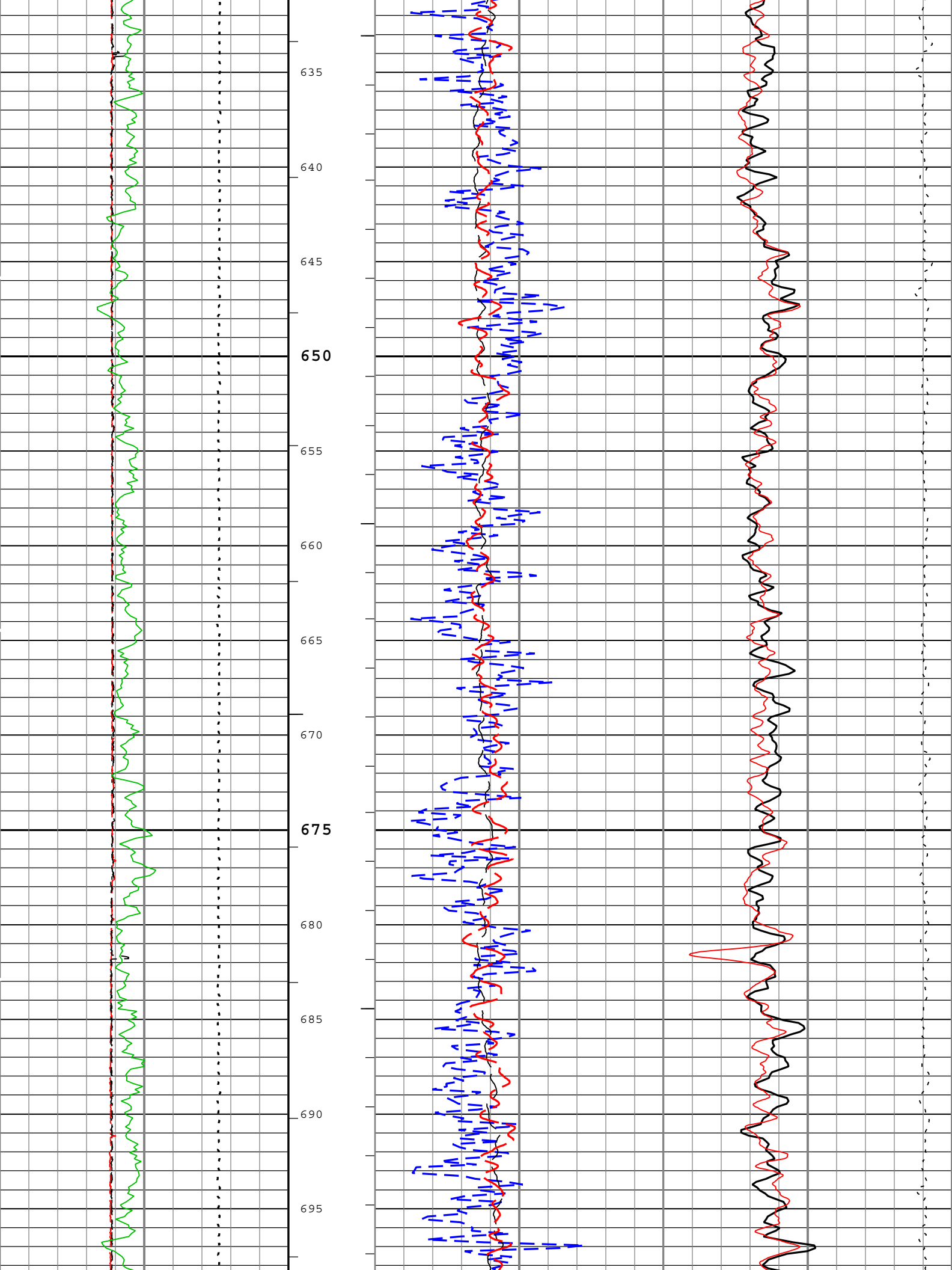
| | | |
|--|-------|-------|
| Enhanced Thermal Neutron Porosity (matrix Sandstone) (NPOR_SAN) HGNS-H | | |
| 0.45 | m3/m3 | -0.15 |
| DPHI_SAN2 | | |
| 0.45 | m3/m3 | -0.15 |
| Density Porosity (matrix Sandstone) (DPHI_SAN).1 HDRS-H[1] | | |
| 0.45 | m3/m3 | -0.15 |
| Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H[1] | | |
| 0 | | 20 |

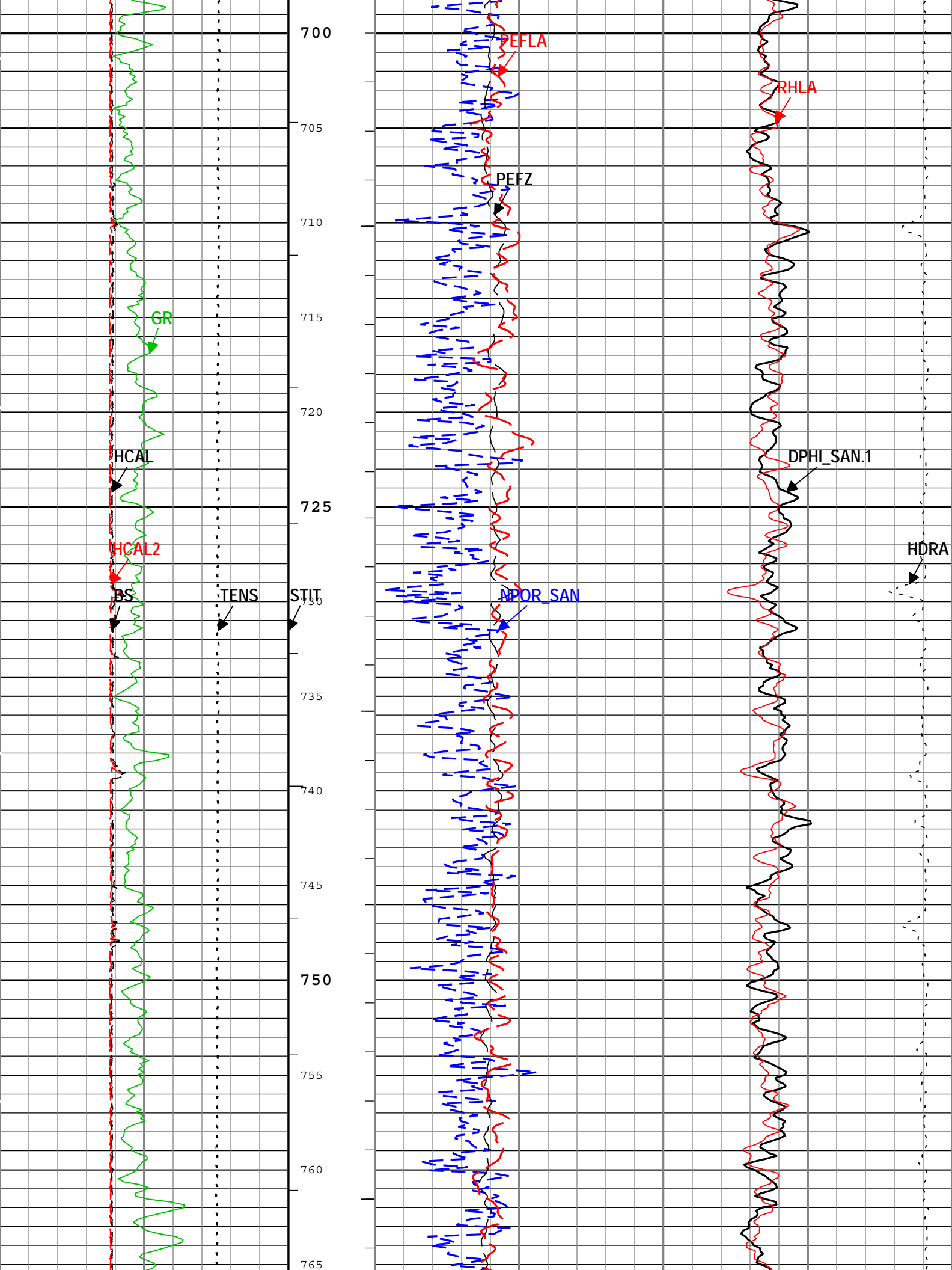
| | | |
|-------|------|-----|
| HCAL2 | | |
| 125 | mm | 375 |
| HCAL | | |
| 125 | mm | 375 |
| GR | | |
| 0 | gAPI | 300 |

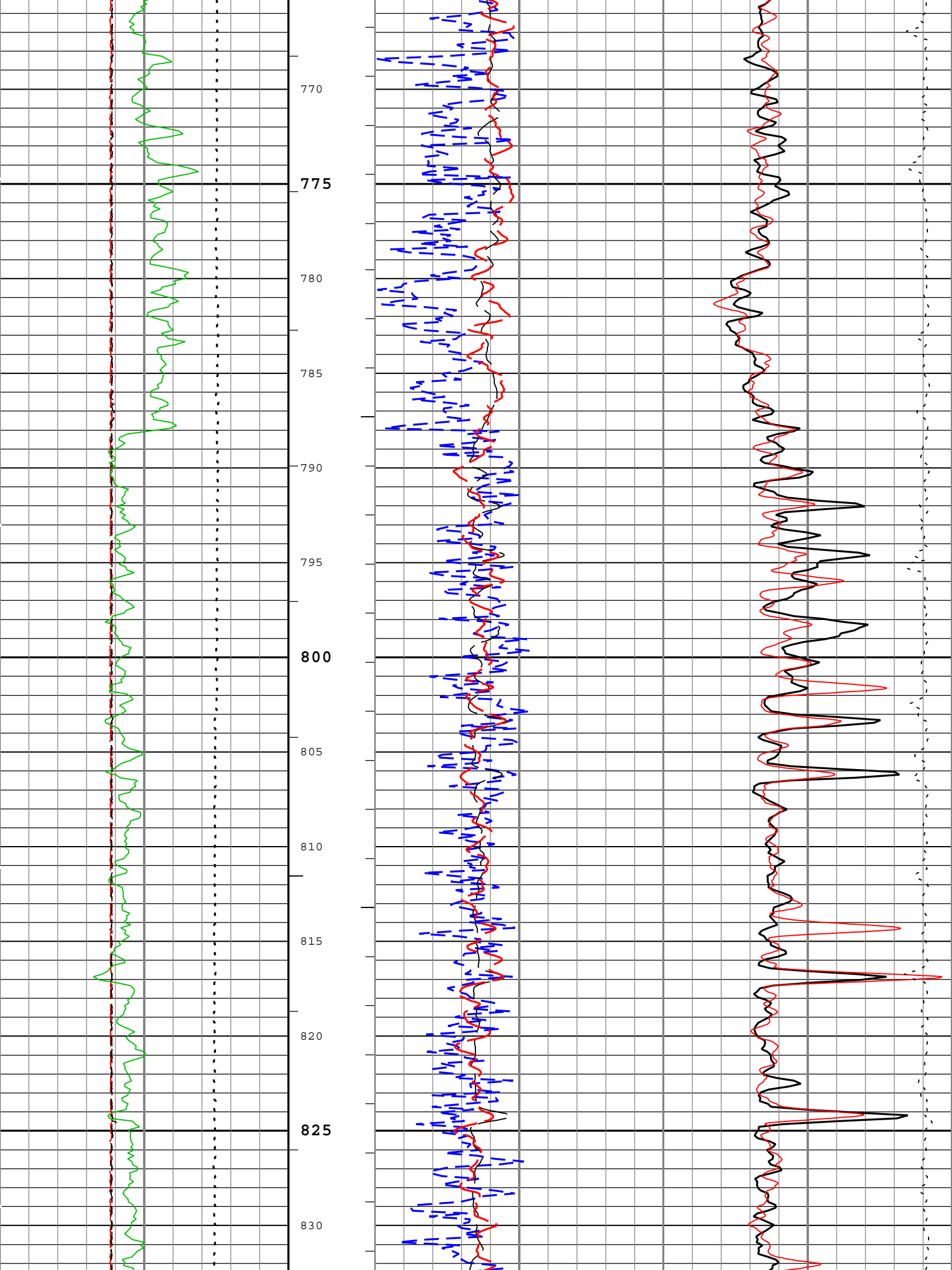
| | | |
|---|-------|-------|
| Standard Resolution Density Porosity (DPHZ) HDRS-H[2] | | |
| 0.45 | m3/m3 | -0.15 |
| Long Spacing Apparent Density (RHLA) HDRS-H[2] | | |
| 1900 | kg/m3 | 2900 |
| Formation Photoelectric Factor from Long Spacing Monosensor Inversion (PEFLA) HDRS-H[2] | | |
| 0 | | 20 |

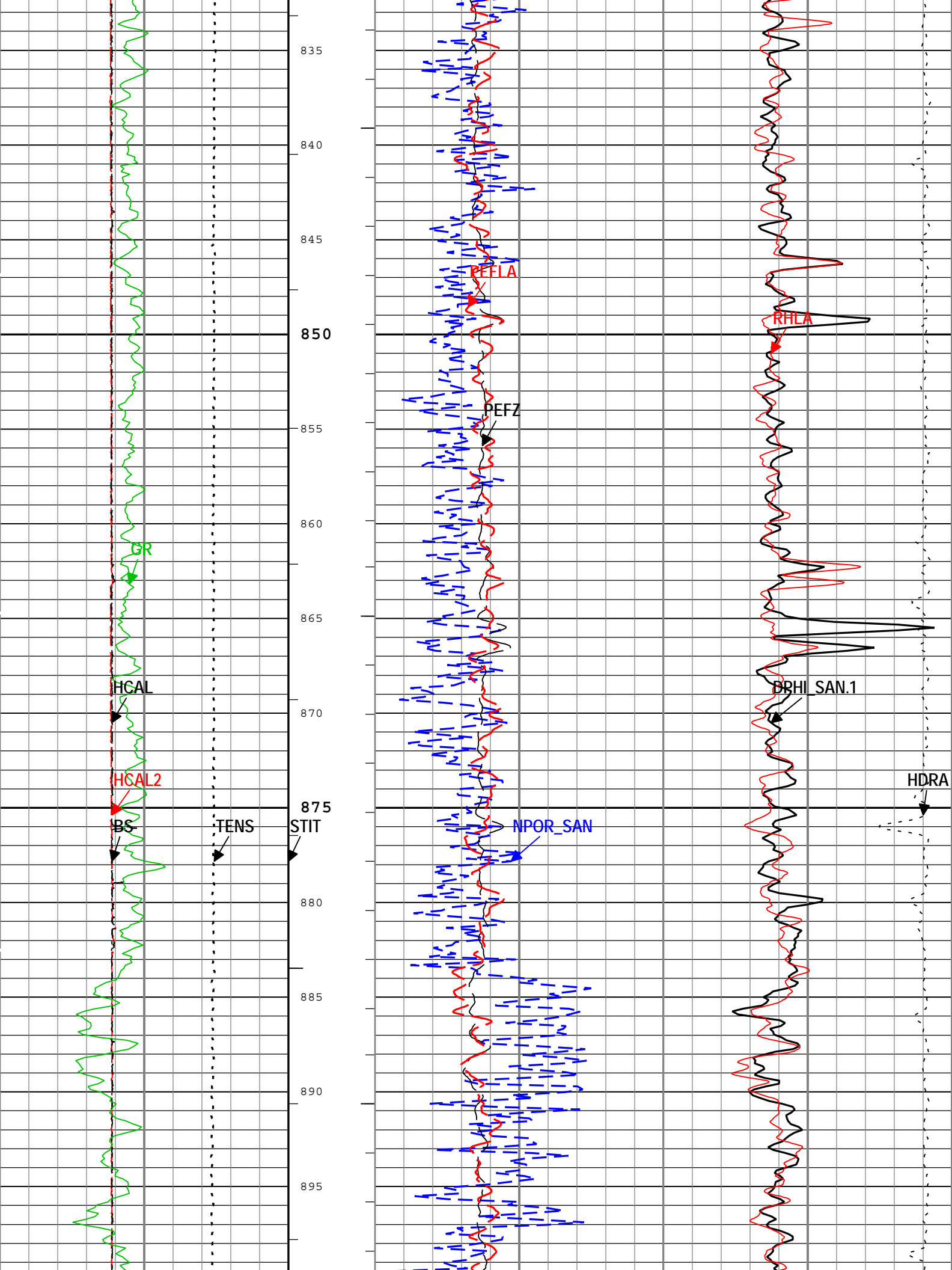
MAIN PASS: PEX-NEUTRON POROSITY LOG - SANDSTONE 2650 KG/M3

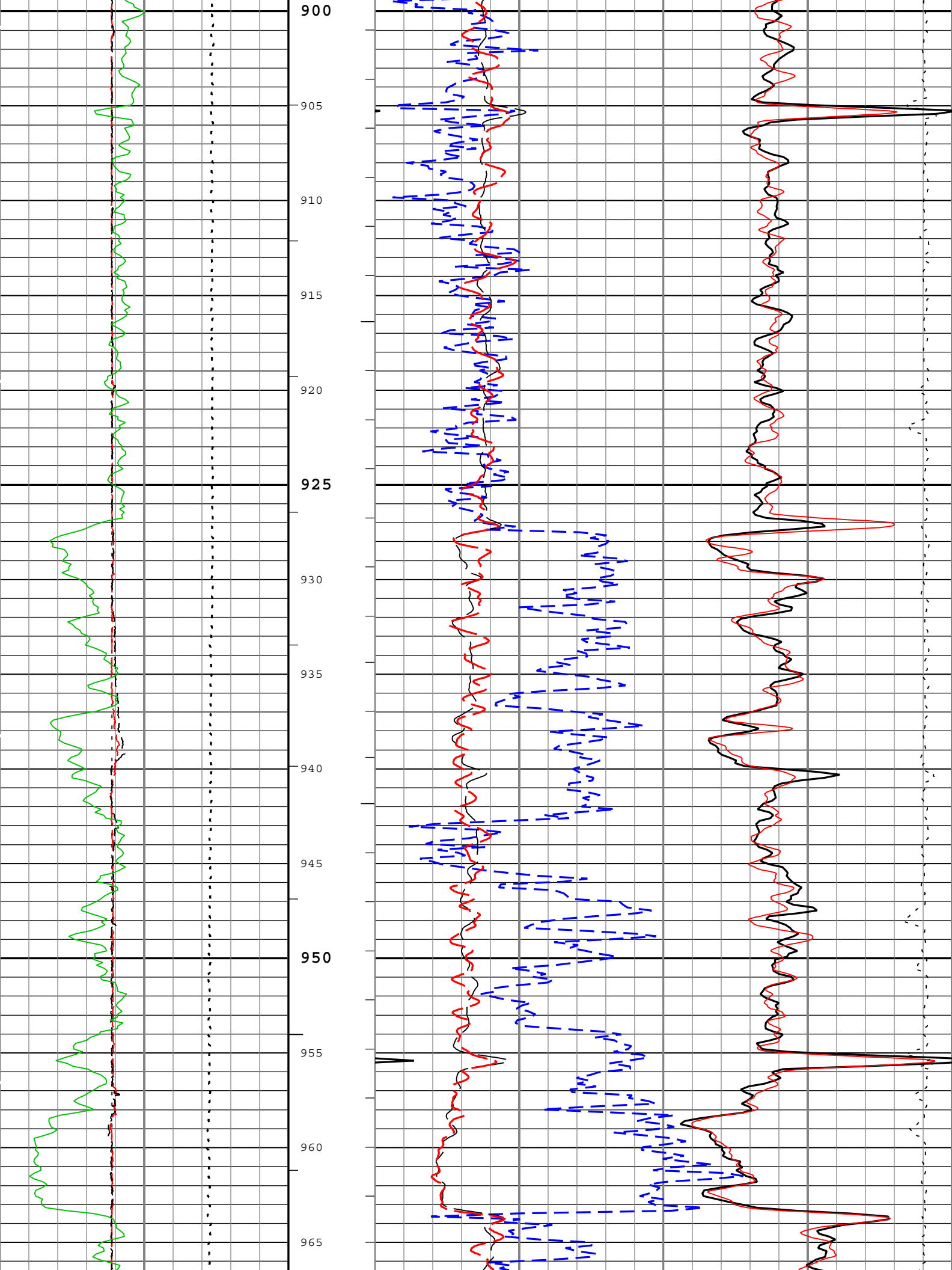


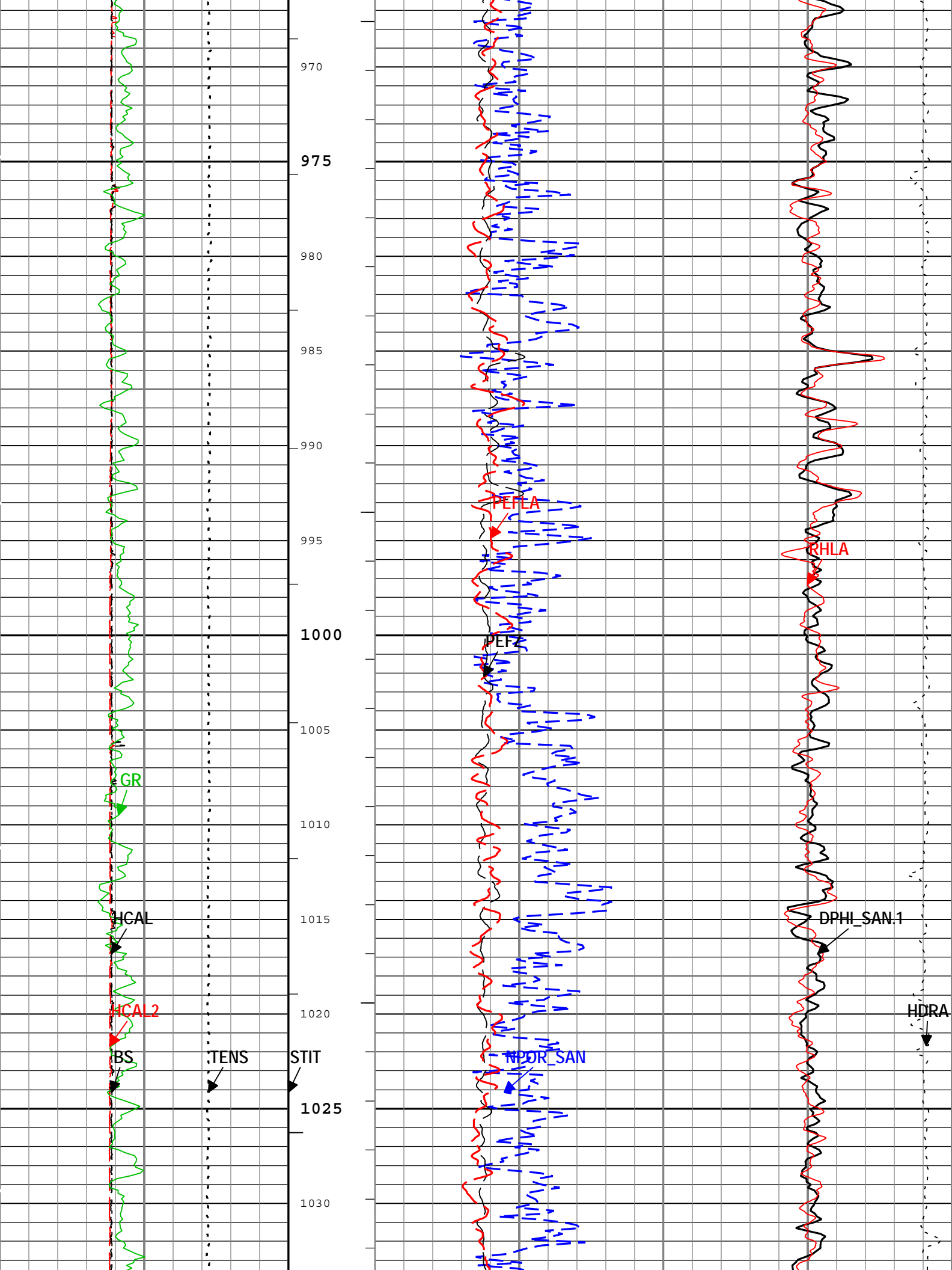


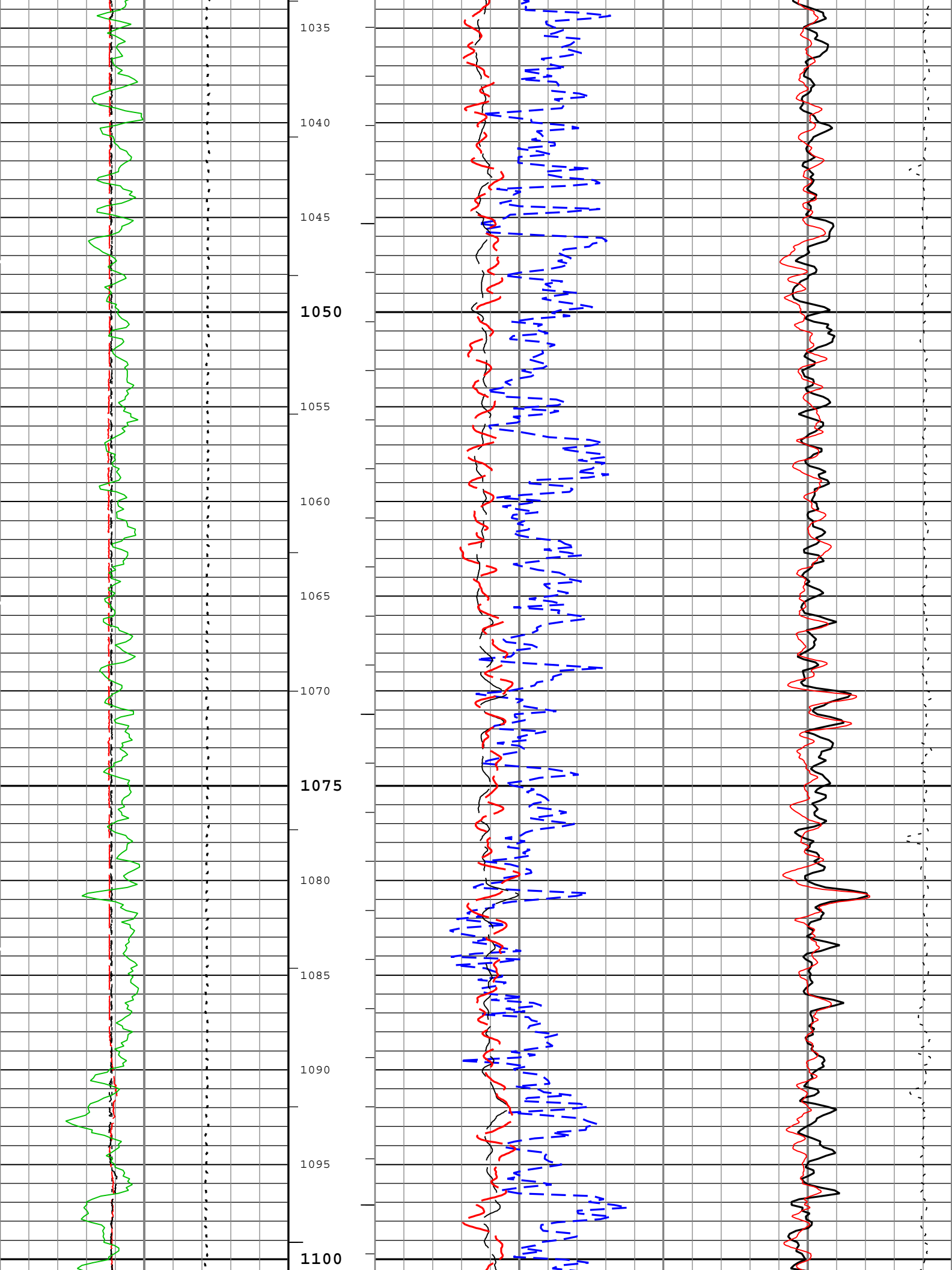


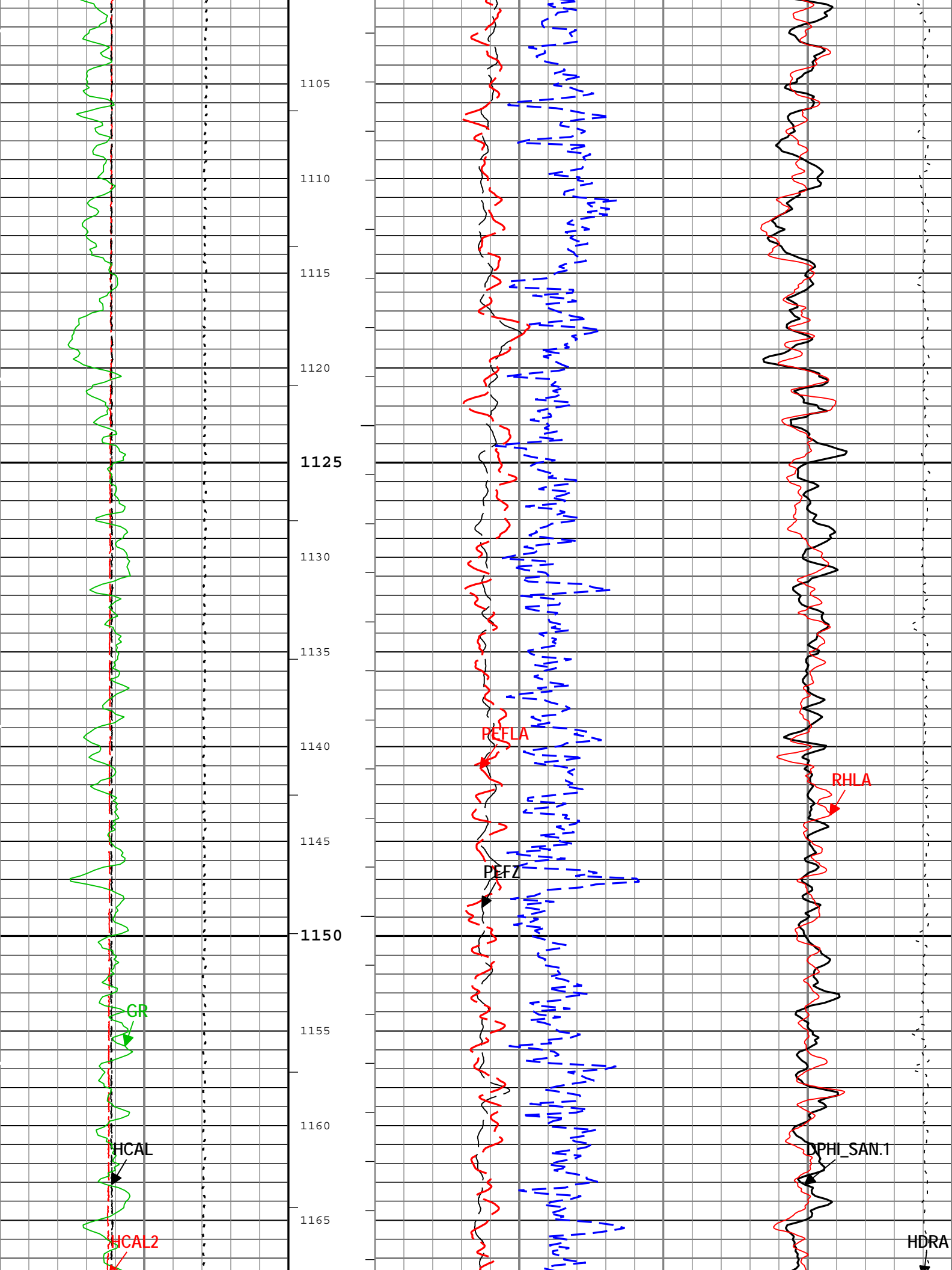


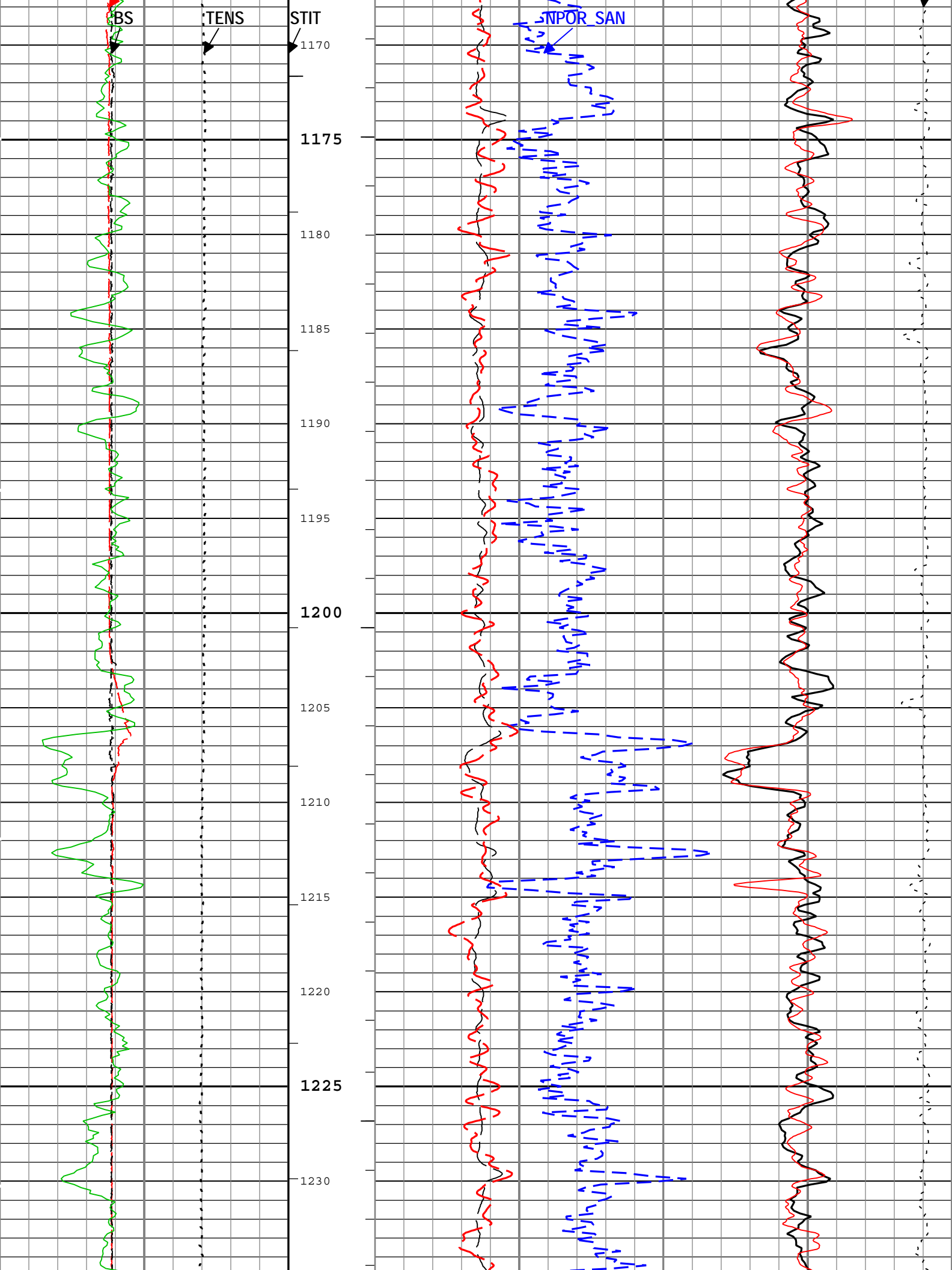


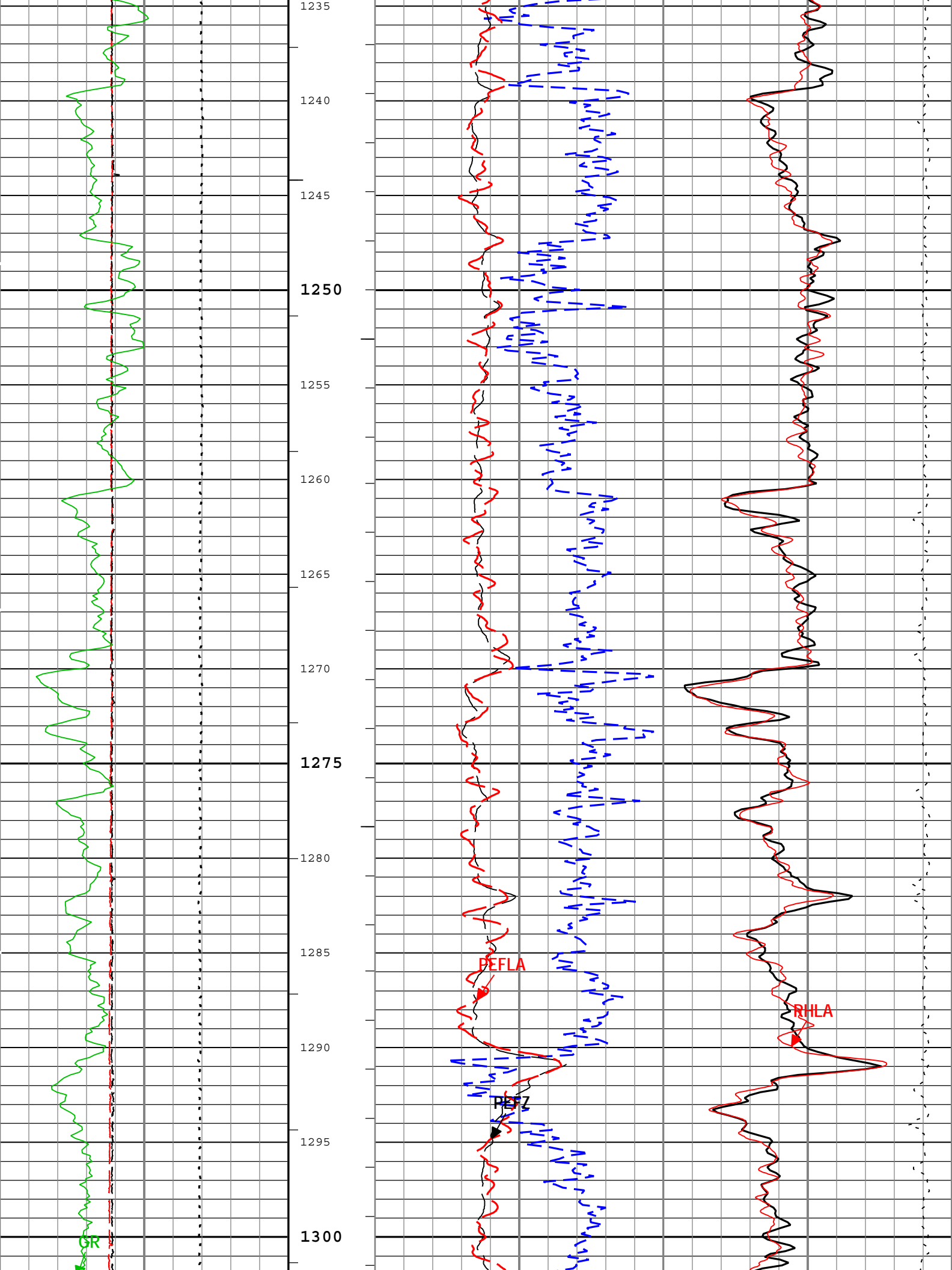


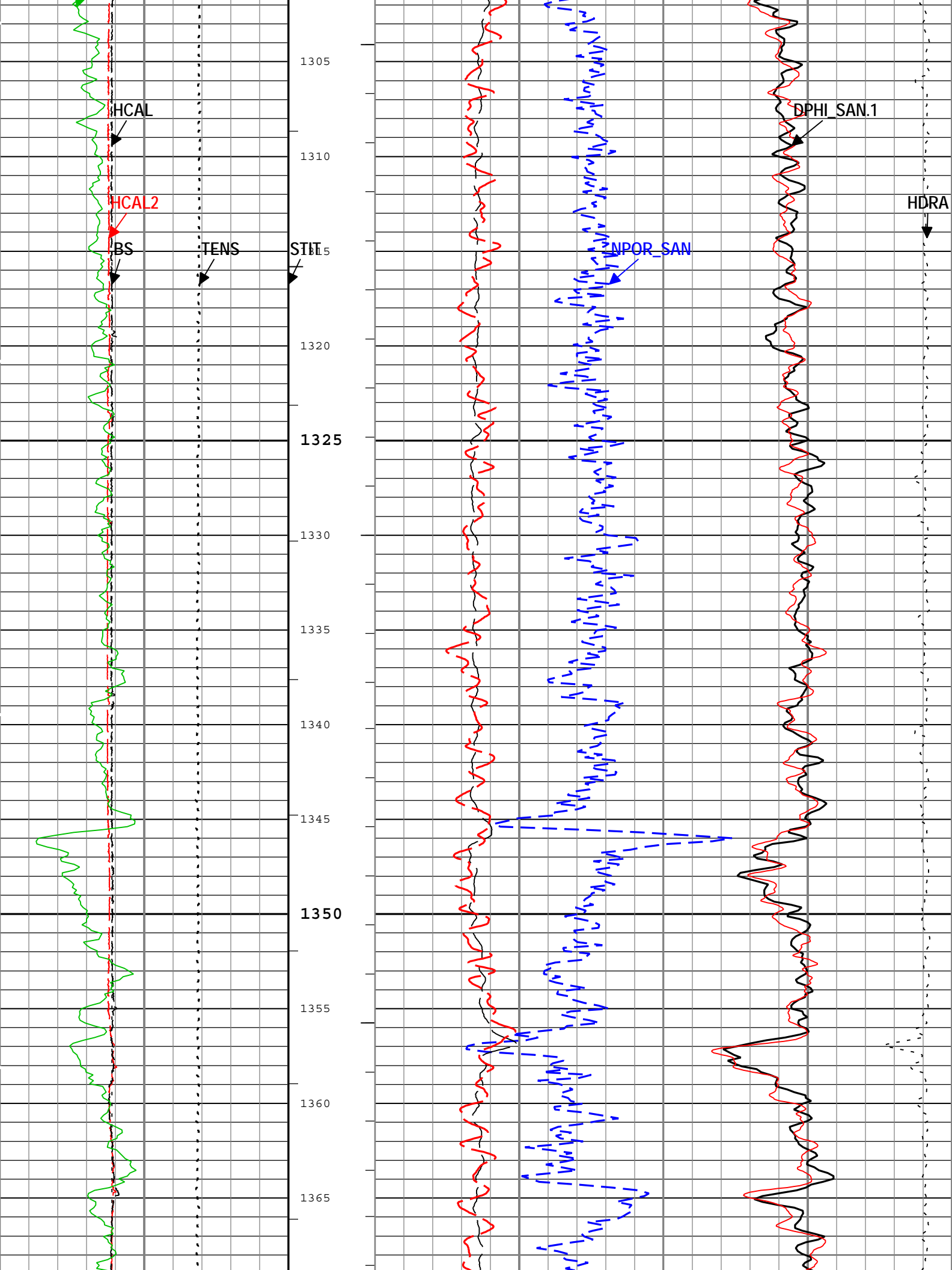


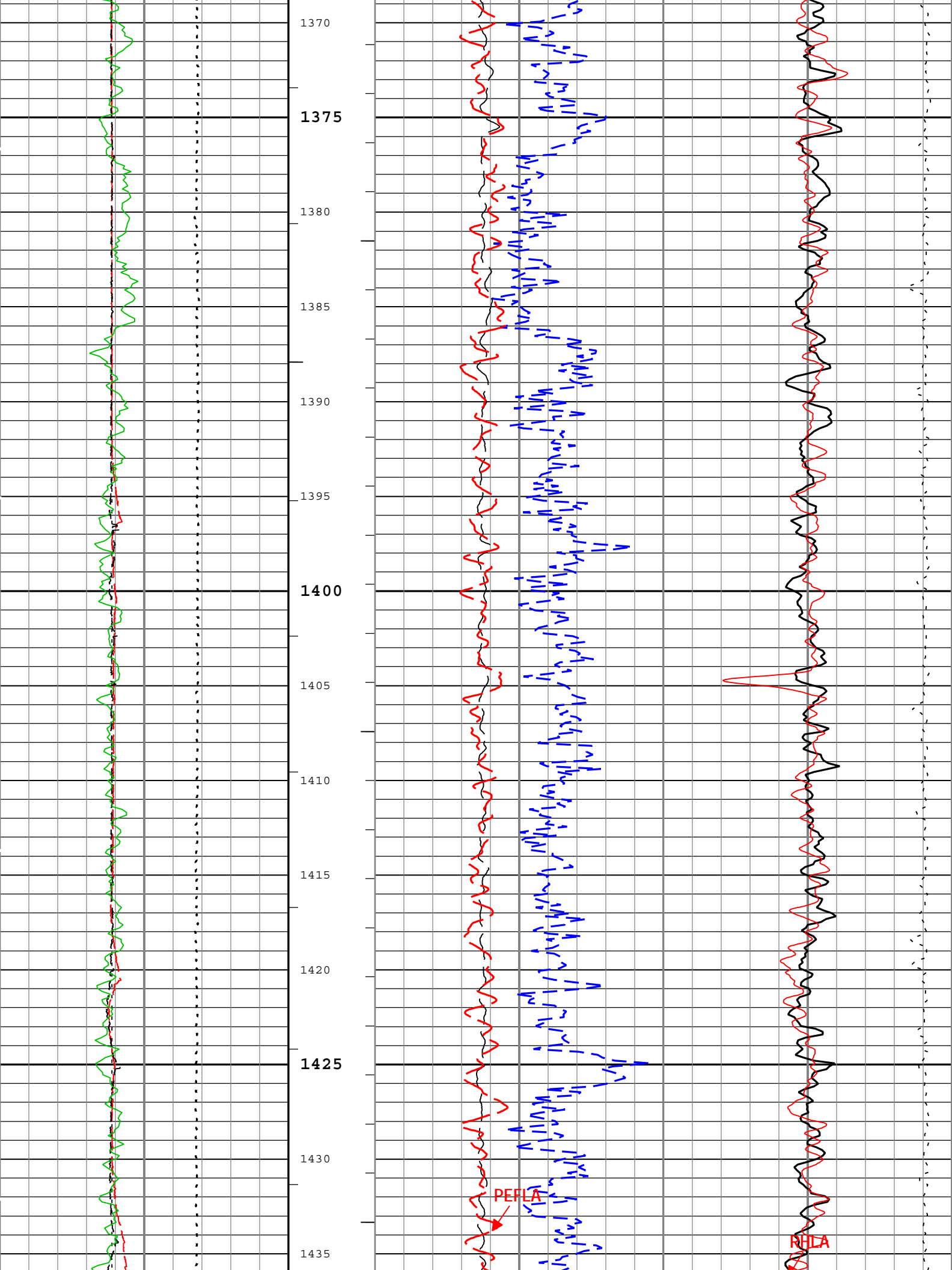


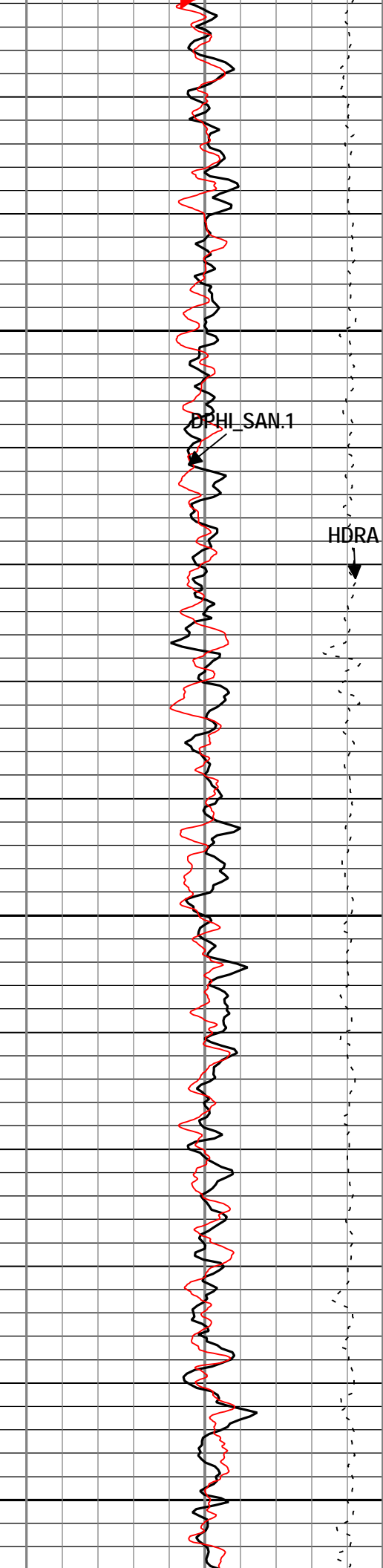
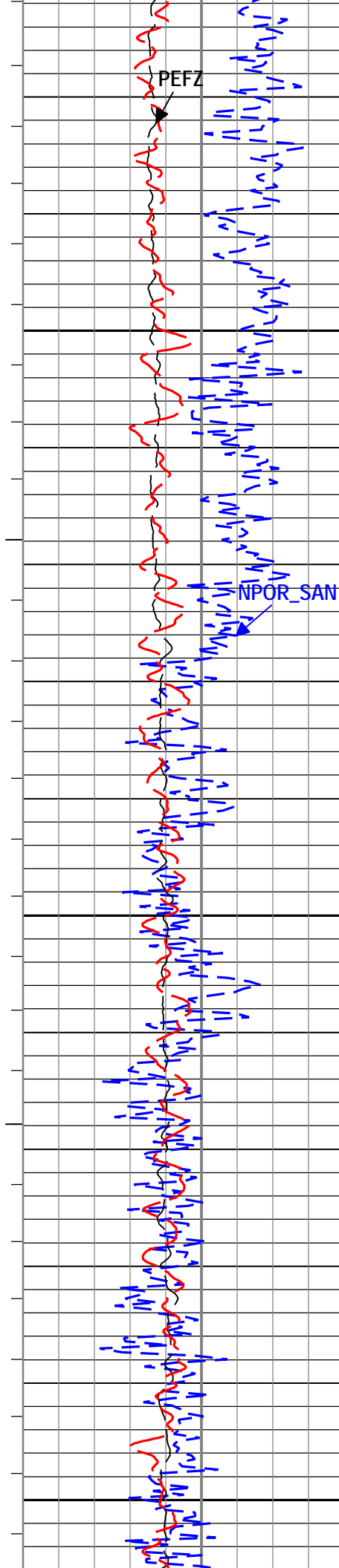
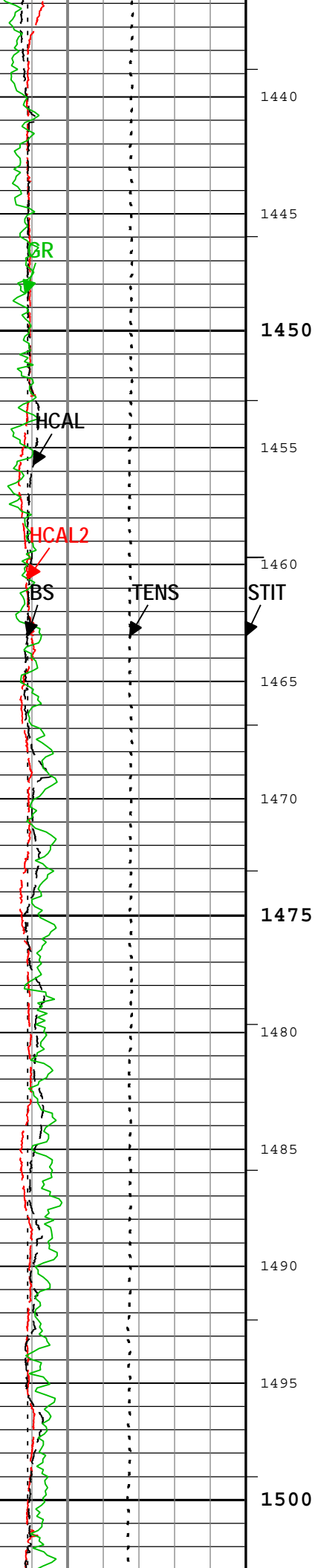


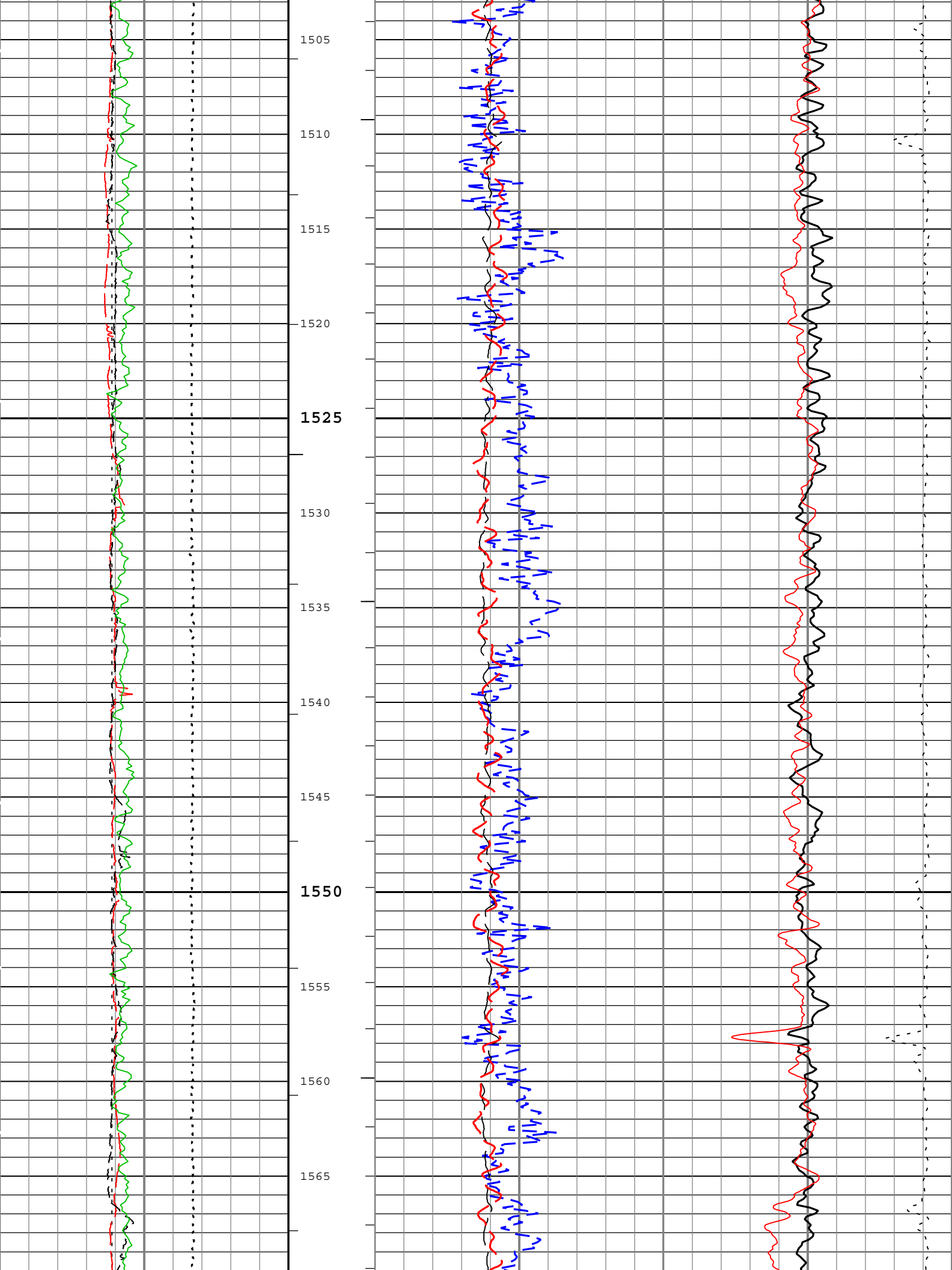


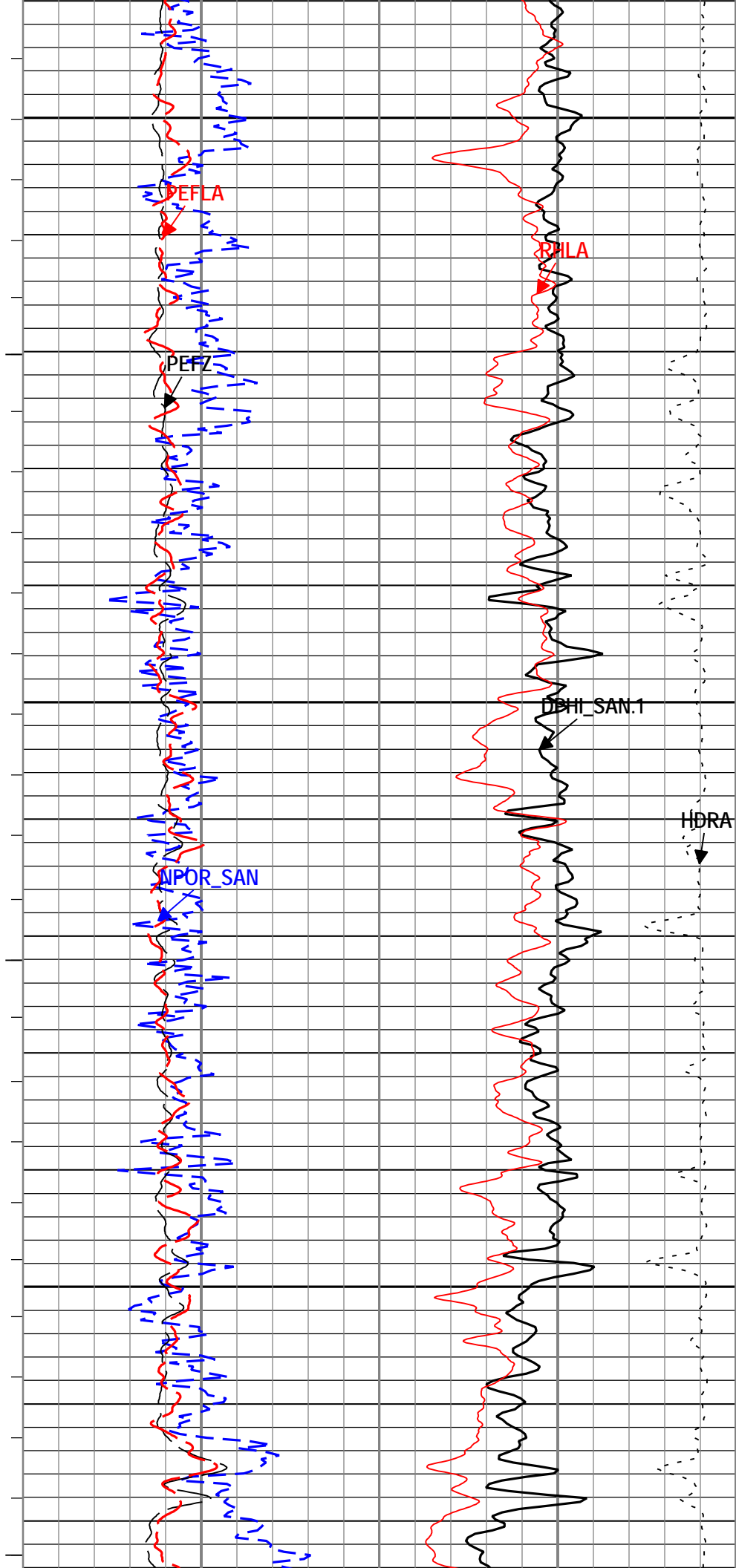
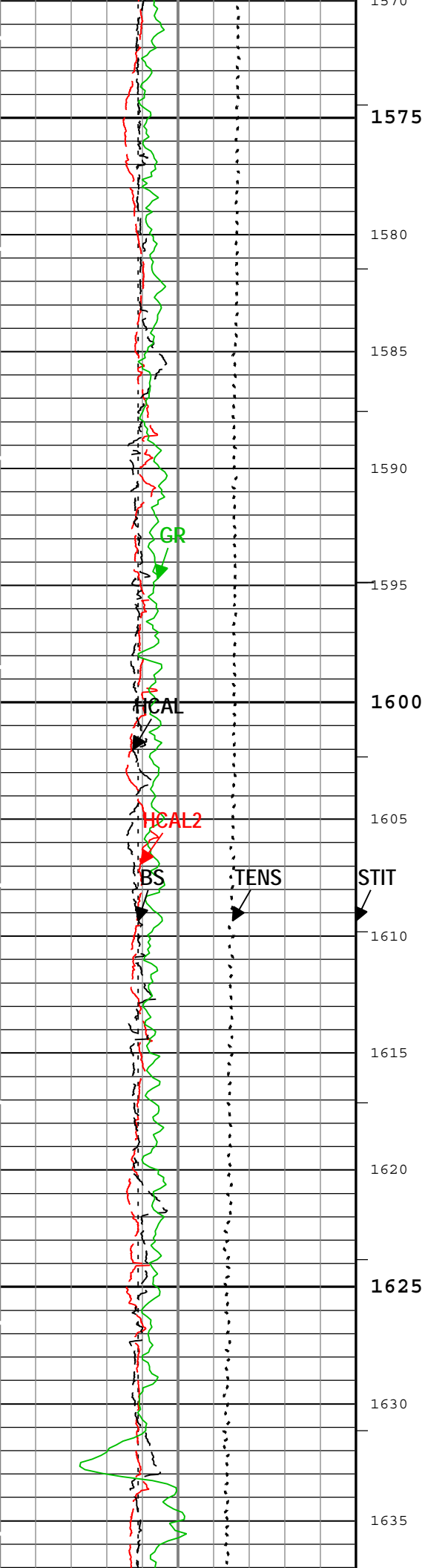


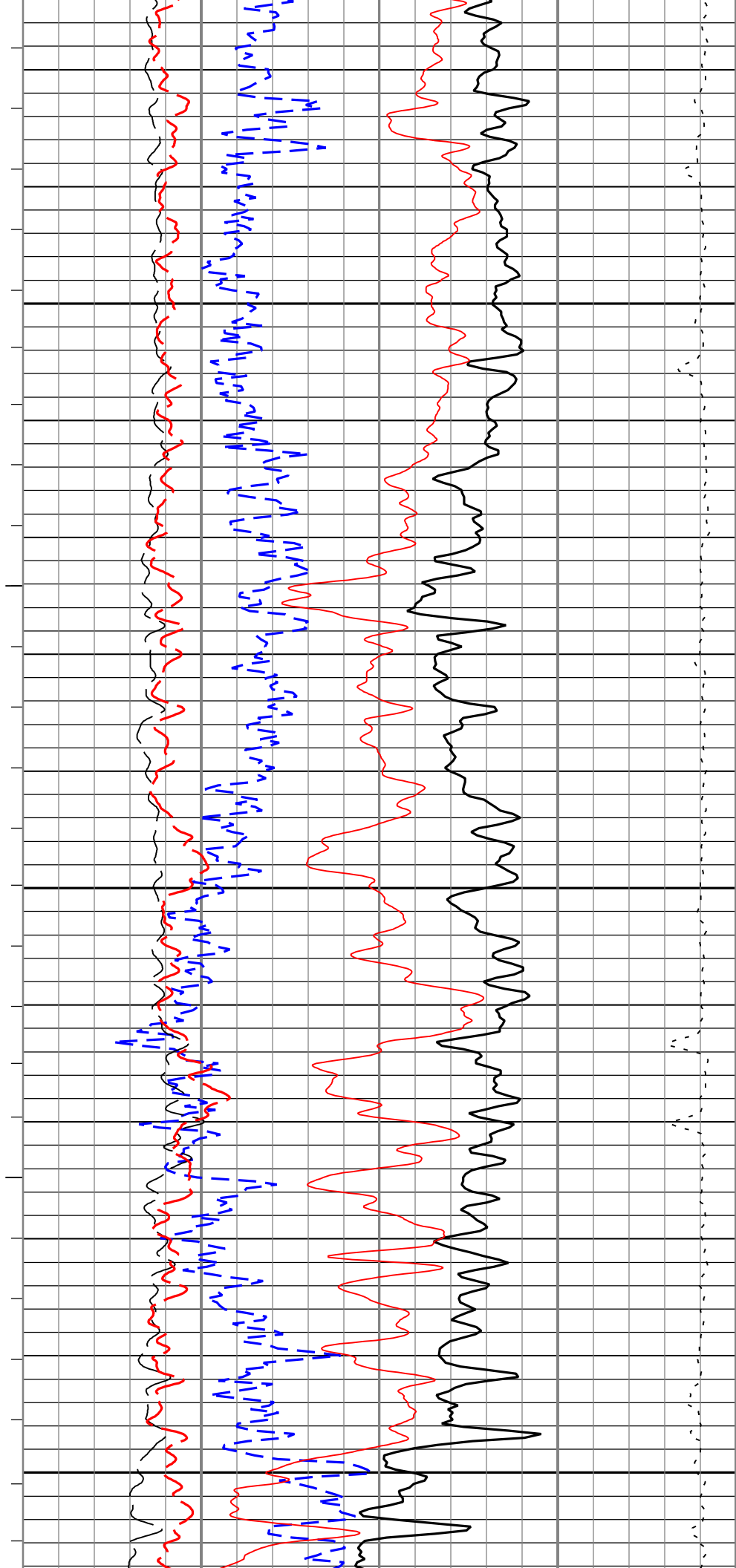
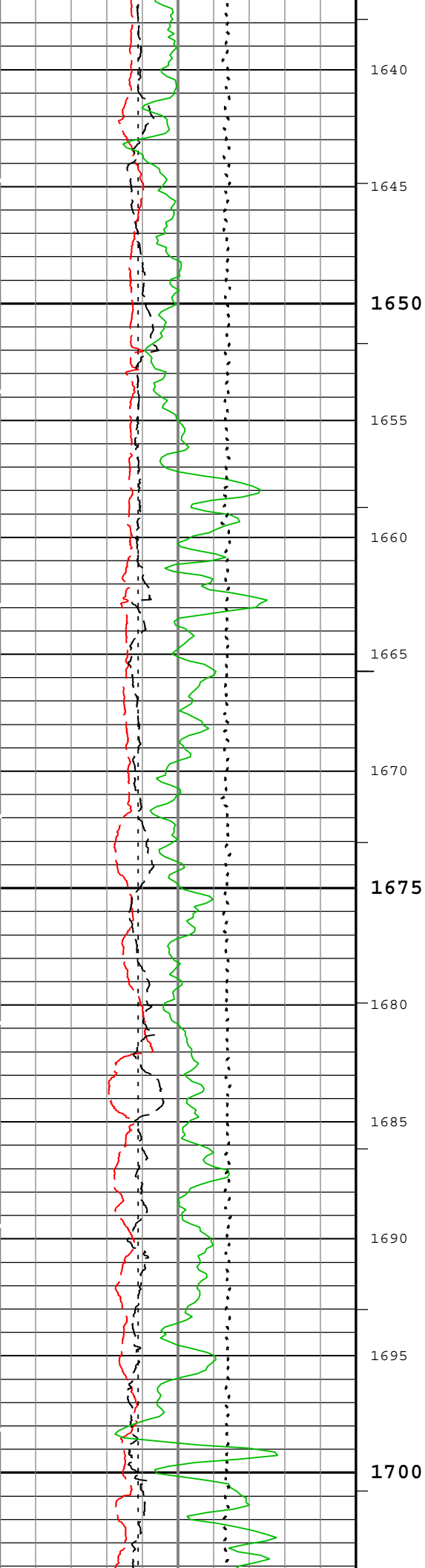


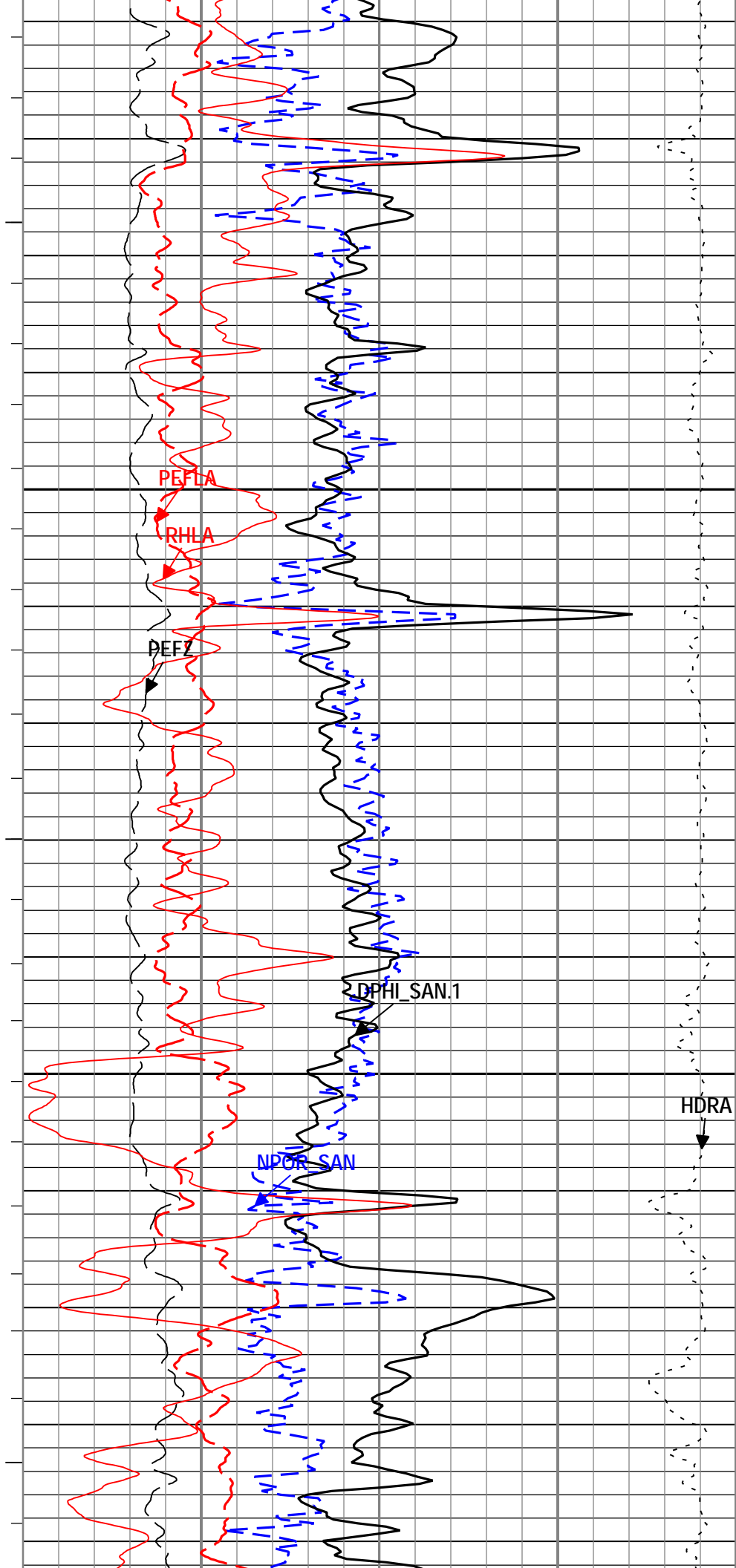
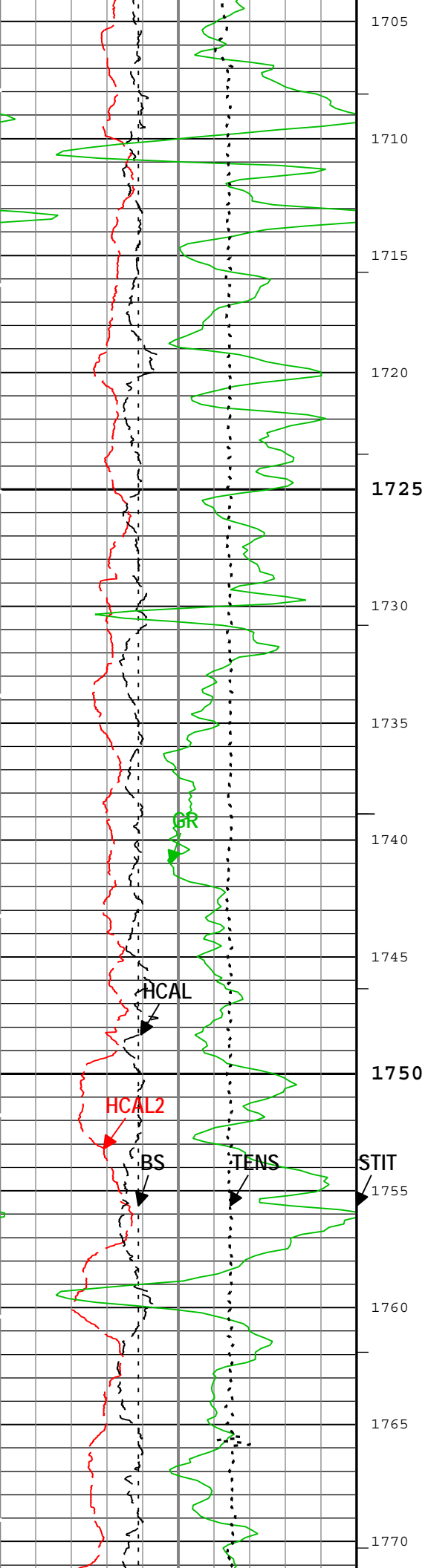


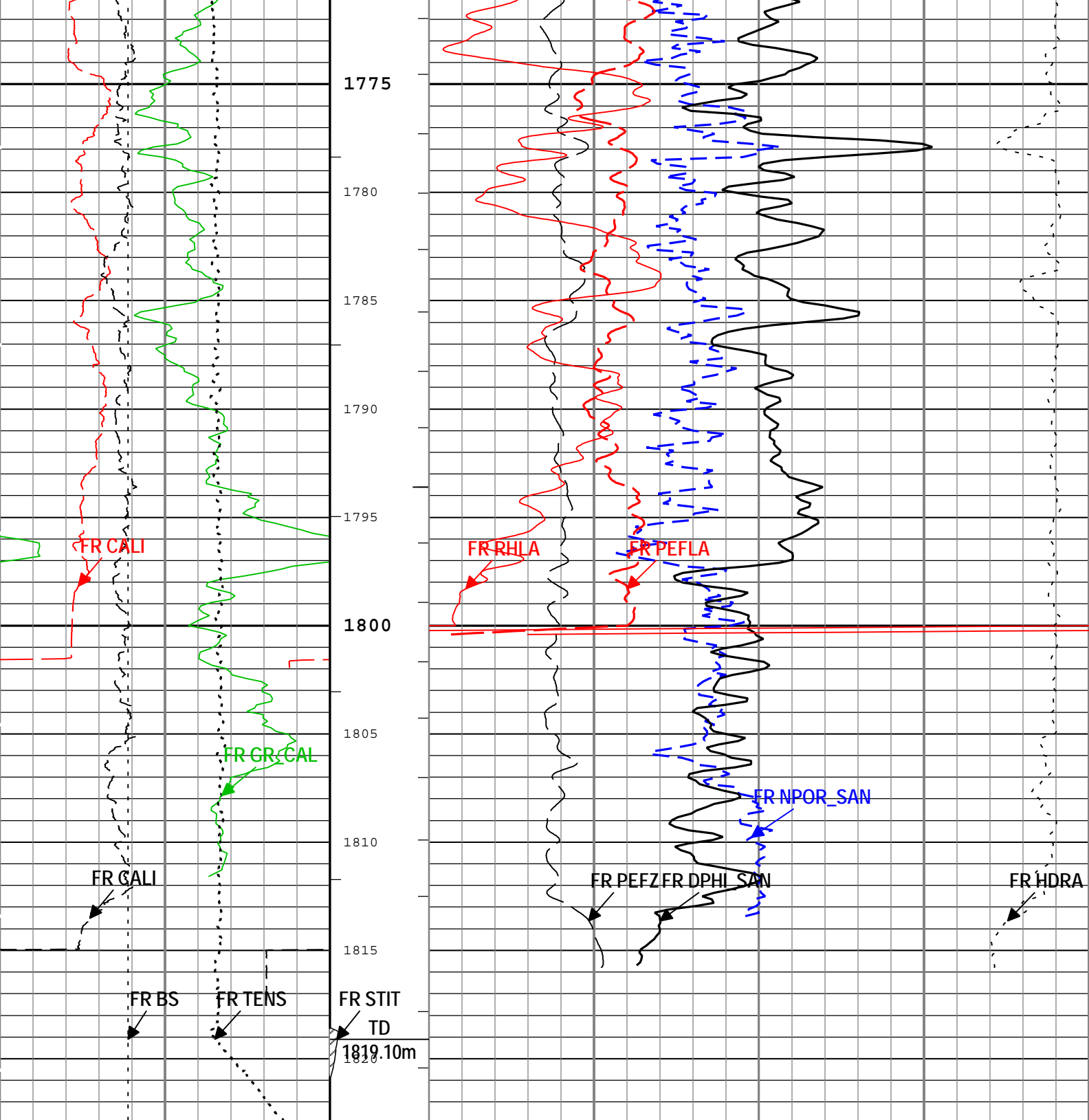












MAIN PASS: PEX-NEUTRON POROSITY LOG - SANDSTONE 2650 KG/M3

| Bit Size (BS) | | |
|----------------------|------|-----|
| 125 | mm | 375 |
| HCAL2 | | |
| 125 | mm | 375 |
| HCAL | | |
| 125 | mm | 375 |
| GR | | |
| 0 | gAPI | 300 |
| Cable Tension (TENS) | | |

| Enhanced Thermal Neutron Porosity (matrix Sandstone) (NPOR_SAN) HGNS-H | | |
|--|-------|-------|
| 0.45 | m3/m3 | -0.15 |
| DPHI_SAN2 | | |
| 0.45 | m3/m3 | -0.15 |
| Density Porosity (matrix Sandstone) (DPHI_SAN).1 HDRS-H[1] | | |
| 0.45 | m3/m3 | -0.15 |
| Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H[1] | | |
| 0 | | 20 |
| Standard Resolution Density Porosity (DPHZ) HDRS-H[2] | | |

| | | | | | | | | | |
|---|-------|---|---|---|-------|-------|--|--|--|
| | 25000 | N | 0 | 0.45 | m3/m3 | -0.15 | | | |
| | | | | Long Spacing Apparent Density (RHLA) HDRS-H[2] | | | | | |
| | | | | 1900 | kg/m3 | 2900 | | | |
| | | | | Formation Photoelectric Factor from Long Spacing Monosensor Inversion (PEFLA) HDRS-H[2] | | | | | |
| | | | | 0 | 20 | | | | |
| | | | | Density Standoff Correction (HDRA) HDRS-H[1] | | | | | |
| | | | | 200 | kg/m3 | -50 | | | |
| — ICV - Integrated Cement Volume every 1.00 (m3) | | | | | | | | | |
| — IHV - Integrated Hole Volume every 0.10 (m3) | | | | | | | | | |
| — IHV - Integrated Hole Volume every 1.00 (m3) | | | | | | | | | |
| TIME_1900 - Time Marked every 60.00 (s) | | | | | | | | | |
| — ICV - Integrated Cement Volume every 0.10 (m3) | | | | | | | | | |
| Description: MCFL processing LQC for Platform Express Format: Log (NUC-240) Index Scale: 1:240 Index Unit: m Index Type: Measured Depth | | | | | | | | | |
| Creation Date: 15-Jan-2014 01:22:56 | | | | | | | | | |

| Channel Processing Parameters | | | | |
|-------------------------------|--|-----------------|-----------------------|-------|
| Parameter | Description | Tool | Value | Unit |
| BARI | Barite Mud Presence Flag | Borehole | No | |
| BHS | Borehole Status (Open or Cased Hole) | Borehole | Depth Zoned | |
| BHT | Bottom Hole Temperature | Borehole | 71.5 | degC |
| BS | Bit Size | WLSESSION | Depth Zoned | mm |
| BSAL | Borehole Salinity | Borehole | 0 | ppm |
| BSCO | Borehole Salinity Correction Option | HGNS-H | No | |
| CALI_SHIFT.1 | CALI Supplementary Offset | HDRS-H | 4.4 | mm |
| CALI_SHIFT.2 | CALI Supplementary Offset | HDRS-H | 13.5 | mm |
| CBLO | Casing Bottom (Logger) | WLSESSION | 603 | m |
| CCCO | Casing & Cement Thickness Correction Option | HGNS-H | Yes | |
| CSODDRL | Casing Outer Diameter - Zoned along driller depths | WLSESSION | 244.5 | mm |
| DC_MODE | Depth Correction Mode | DepthCorrection | Real-time | |
| DFD | Drilling Fluid Density | Borehole | 1025 | kg/m3 |
| DFT | Drilling Fluid Type | Borehole | Oil | |
| DHC.1 | Density Hole Correction | HDRS-H | Bit Size | |
| DHC.2 | Density Hole Correction | HDRS-H | Bit Size | |
| FCD | Future Casing (Outer) Diameter | WLSESSION | 177.8 | mm |
| FD | Fluid Density | Borehole | 1000 | kg/m3 |
| FSAL | Formation Salinity | Borehole | 0 | ppm |
| FSCO | Formation Salinity Correction Option | HGNS-H | No | |
| GCLF.1 | Coal-Like Formation | HDRS-H | No | |
| GCLF.2 | Coal-Like Formation | HDRS-H | No | |
| GCSE_DOWN_PASS | Generalized Caliper Selection for WL Log Down Passes | Borehole | BS | |
| GCSE_UP_PASS | Generalized Caliper Selection for WL Log Up Passes | Borehole | Depth Zoned | |
| GR_MULTIPLIER | Gamma Ray Multiplier | HGNS-H | 1 | |
| GRSE | Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity | Borehole | REMS | |
| GTSE | Generalized Temperature Selection, from Measured or Computed Temperature | Borehole | CTEM | |
| HSCO | Hole Size Correction Option | HGNS-H | Yes | |
| HVCS | Integrated Hole Volume Caliper Selection | Borehole | Compute Area from GHD | |
| IHVC | Integrated Hole Volume Control | Borehole | Start | |
| MATR | Rock Matrix for Neutron Porosity Corrections | Borehole | SANDSTONE | |

| | | | | |
|--------|--|----------|------------------|-------|
| MATR | Rock Matrix for Neutron Porosity Corrections | Borehole | SANDSTONE | |
| MCCO | Mud Cake Correction Option | HGNS-H | No | |
| MDEN | Matrix Density for Density Porosity | Borehole | 2650 | kg/m3 |
| MWCO | Mud Weight Correction Option | HGNS-H | No | |
| NAAC.1 | Switch for the correction of formation activation by the APS | HDRS-H | Off | |
| NAAC.2 | Switch for the correction of formation activation by the APS | HDRS-H | Off | |
| NPRM.1 | HRDD Nuclear Processing Mode | HDRS-H | High Resolution | |
| NPRM.2 | HRDD Nuclear Processing Mode | HDRS-H | Mono Sensor Only | |
| NTCO.1 | HRDD Nuclear Temperature Correction Option | HDRS-H | On | |
| NTCO.2 | HRDD Nuclear Temperature Correction Option | HDRS-H | On | |
| PTCO | Pressure Temperature Correction Option | HGNS-H | No | |
| SOCN | Standoff Distance | HGNS-H | 3.175 | mm |
| SOCO | Standoff Correction Option | HGNS-H | Yes | |
| TD | Total Measured Depth | Borehole | 1819.1 | m |

| Depth Zone Parameters | | | |
|-----------------------|-------|-------------|------------|
| Parameter | Value | Start (m) | Stop (m) |
| BHS | Cased | 575 | 603 |
| BHS | Open | 603 | 1822.88 |
| BS | 311 | 575 | 603 |
| BS | 222 | 603 | 1819.1 |
| GCSE_UP_PASS | BS | 575 | 603 |
| GCSE_UP_PASS | CALI | 603 | 1822.88 |
| All depth are actual. | | | |

| Tool Control Parameters | | | | |
|-------------------------|--|-----------|------------------|------|
| Parameter | Description | Tool | Value | Unit |
| HMCA_BRD_TYPE | HMCA Board Type | HGNS-H | 1 | |
| HRGD_BRD_TYPE.1 | HRGD Board Type | HDRS-H | WITH_HET | |
| HRGD_BRD_TYPE.2 | HRGD Board Type | HDRS-H | WITH_HET | |
| MAX_LOG_SPEED | Toolstring Maximum Logging Speed | WLSESSION | 548.64 | m/h |
| NDTC.1 | Nuclear Dead Time Correction | HDRS-H | On | |
| NDTC.2 | Nuclear Dead Time Correction | HDRS-H | On | |
| NPUC.1 | Nuclear Pile-Up Correction | HDRS-H | Off | |
| NPUC.2 | Nuclear Pile-Up Correction | HDRS-H | Off | |
| STSO_HRDD.1 | Temperature Source for the Density Algorithm | HDRS-H | HET data channel | |
| STSO_HRDD.2 | Temperature Source for the Density Algorithm | HDRS-H | HET data channel | |

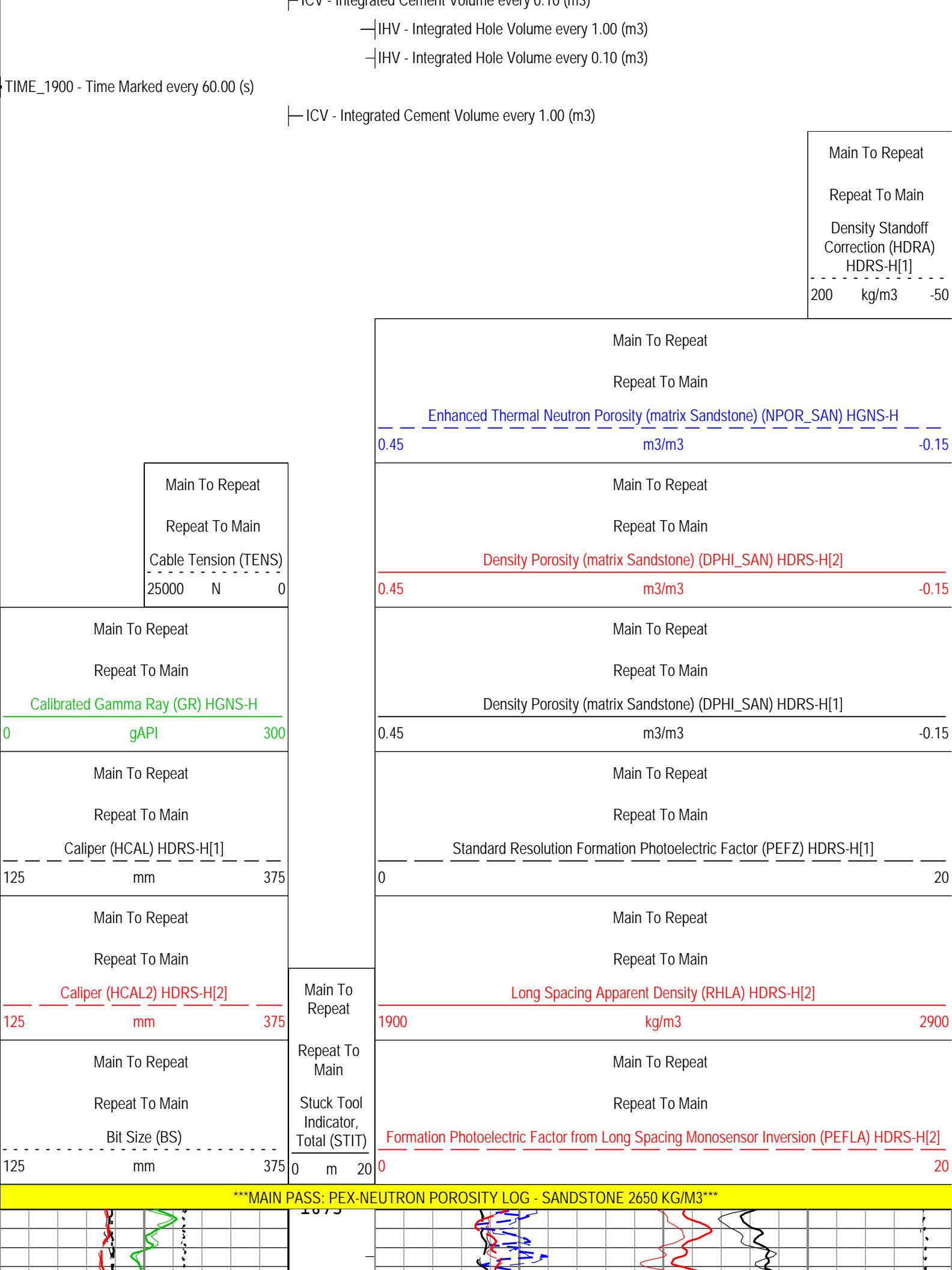
| 1.1 | | | | | | | | | |
|-----|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
| | | | | | | | | | |

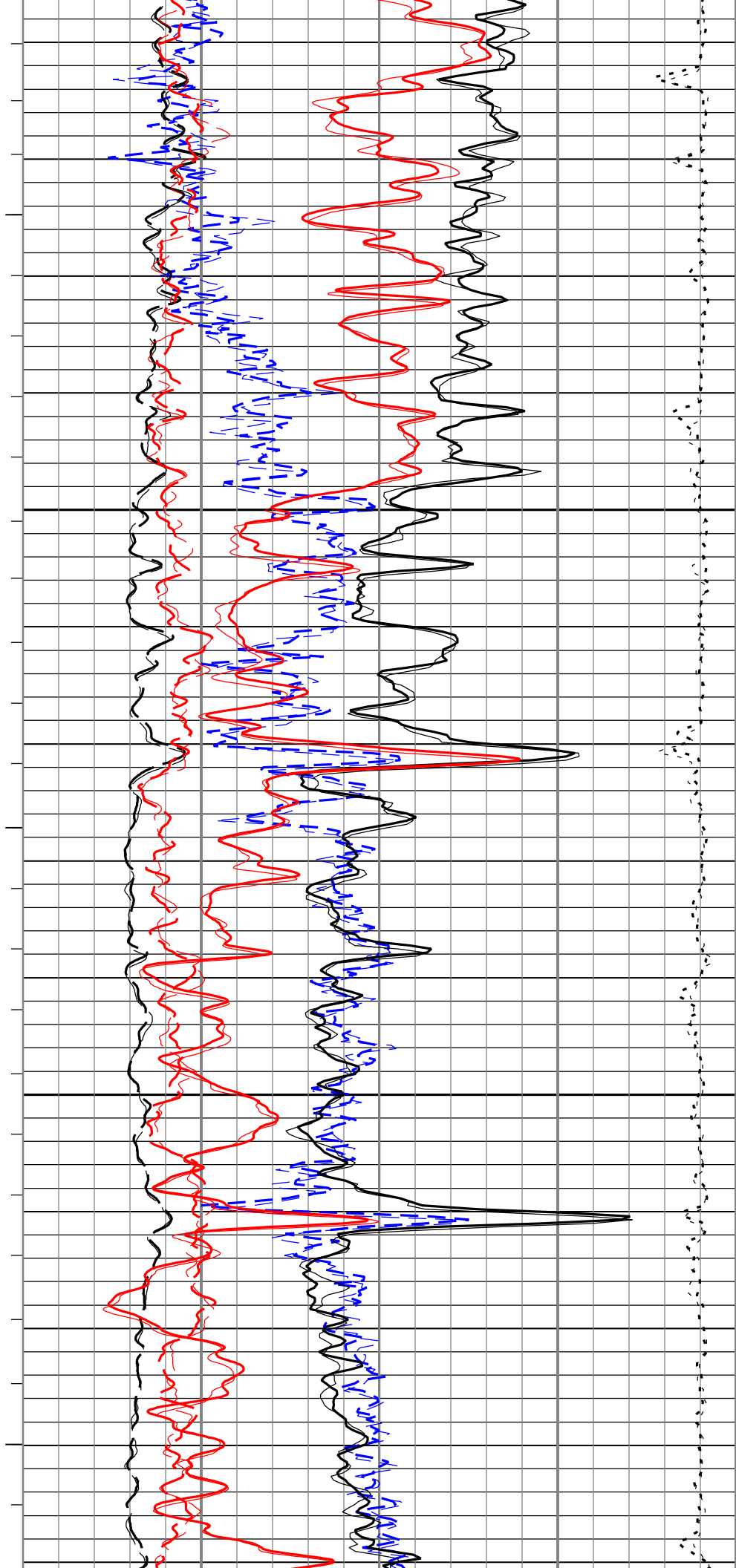
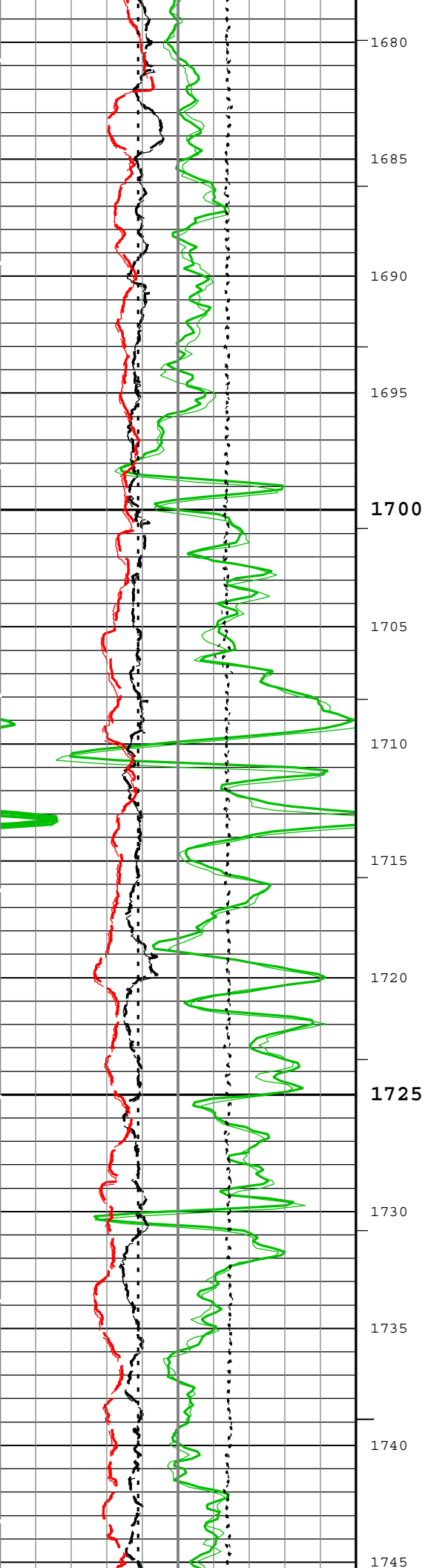
| Pass Summary | | | | | | | | | |
|--|----------------|-----------|-----------|-----------|------------------------|------------------------|----------|-------------|-----------------------|
| Run Name | Pass Objective | Direction | Top | Bottom | Start | Stop | DSC Mode | Depth Shift | Include Parallel Data |
| 1.1 | Log[4]:Up | Up | 1664.09 m | 1816.40 m | 14-Jan-2014 6:23:51 PM | 14-Jan-2014 6:42:06 PM | ON | 1.27 m | Yes |
| 1.1 | Log[5]:Up | Up | 543.85 m | 1822.88 m | 14-Jan-2014 6:48:20 PM | 14-Jan-2014 8:17:20 PM | ON | -1.90 m | Yes |
| All depths are referenced to toolstring zero | | | | | | | | | |

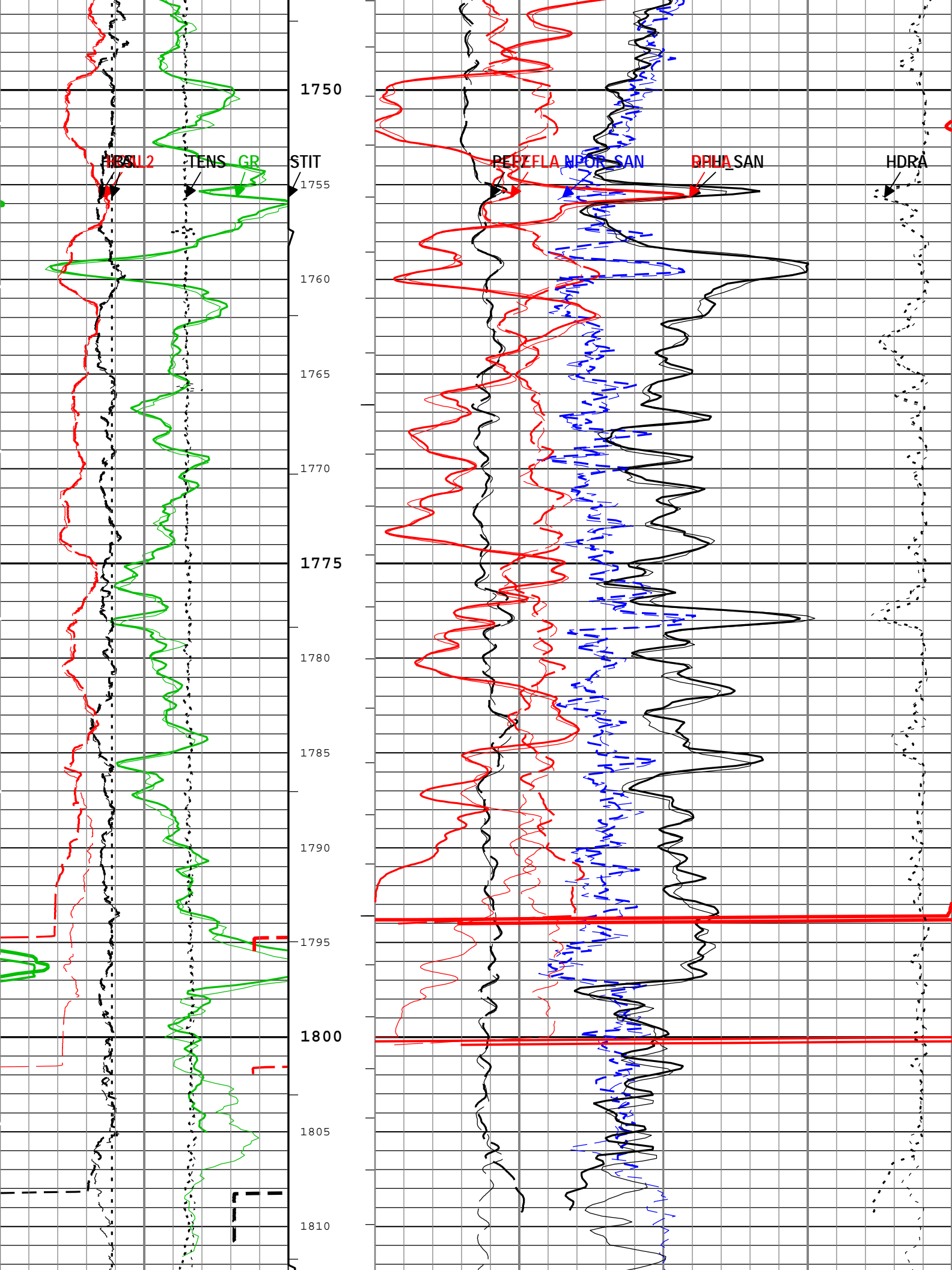
| | | |
|---------------------|---|----------------------------|
| Log | Company:CONOCOPHILLIPS CANADA RESOURCES CORP. | Well:COPRC DODO CANYON E76 |
| 1.1: Log[5]:Up:S023 | | |

Description: MCFL processing LQC for Platform Express Format: Log (NUC-240 RA) Index Scale: 1:240 Index Unit: m Index Type: Measured Depth
Creation Date: 15-Jan-2014 01:23:00

L-ICV: Integrated Cement Volume every 0.10 (m3)









MAIN PASS: PEX-NEUTRON POROSITY LOG - SANDSTONE 2650 KG/M3

| | | | | |
|----------------------------------|------|------------------------------------|---|-------|
| Main To Repeat | | Main To Repeat | Main To Repeat | |
| Repeat To Main | | | Repeat To Main | |
| Calibrated Gamma Ray (GR) HGNS-H | | | Enhanced Thermal Neutron Porosity (matrix Sandstone) (NPOR_SAN) HGNS-H | |
| 0 | gAPI | | 0.45 | m3/m3 |
| 300 | | | | -0.15 |
| Main To Repeat | | Stuck Tool Indicator, Total (STIT) | Main To Repeat | |
| Repeat To Main | | | Repeat To Main | |
| Caliper (HCAL) HDRS-H[1] | | | Density Porosity (matrix Sandstone) (DPHI_SAN) HDRS-H[2] | |
| 125 | mm | | 0.45 | m3/m3 |
| 375 | | | | -0.15 |
| Main To Repeat | | 0 | Main To Repeat | |
| Repeat To Main | | | Repeat To Main | |
| Caliper (HCAL2) HDRS-H[2] | | | Density Porosity (matrix Sandstone) (DPHI_SAN) HDRS-H[1] | |
| 125 | mm | | 0.45 | m3/m3 |
| 375 | | | | -0.15 |
| Main To Repeat | | | Main To Repeat | |
| Repeat To Main | | | Repeat To Main | |
| Bit Size (BS) | | | Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H[1] | |
| 125 | mm | | 0 | 20 |
| 375 | | | | |
| Main To Repeat | | | Main To Repeat | |
| Repeat To Main | | | Repeat To Main | |
| Cable Tension (TENS) | | | Long Spacing Apparent Density (RHLA) HDRS-H[2] | |
| 25000 | N | | 1900 | kg/m3 |
| 0 | | | | 2900 |
| Main To Repeat | | | Main To Repeat | |
| Repeat To Main | | | Repeat To Main | |
| Cable Tension (TENS) | | | Formation Photoelectric Factor from Long Spacing Monosensor Inversion (PEFLA) HDRS-H[2] | |
| 25000 | N | | 0 | 20 |
| 0 | | | | |
| Main To Repeat | | | Main To Repeat | |
| Repeat To Main | | | Repeat To Main | |
| Cable Tension (TENS) | | | Density Standoff Correction (HDRA) HDRS-H[1] | |
| 25000 | N | | 200 | kg/m3 |
| 0 | | | | -50 |

| | | | | | | | | | |
|--|---|---|----------|-----------------|------------------------|------------------------------------|----------------------------|-------------|-----------------------|
| ICV - Integrated Cement Volume every 1.00 (m3) | | | | | | | | | |
| TIME_1900 - Time Marked every 60.00 (s) | | | | | | | | | |
| IHV - Integrated Hole Volume every 0.10 (m3) | | | | | | | | | |
| IHV - Integrated Hole Volume every 1.00 (m3) | | | | | | | | | |
| ICV - Integrated Cement Volume every 0.10 (m3) | | | | | | | | | |
| Description: MCFL processing LQC for Platform Express Format: Log (NUC-240 RA) Index Scale: 1:240 Index Unit: m Index Type: Measured Depth | | | | | | | | | |
| Creation Date: 15-Jan-2014 01:23:00 | | | | | | | | | |
| 1.1 | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Integration Summary | | | | | | | | | |
| Output Channel(s) | | Output Description | | Input Parameter | | Output Value | | Unit | |
| ICV | | Integrated Cement Volume | | HVCS, FCD | | 2.93 | | m3 | |
| IHV | | Integrated Hole Volume | | HVCS | | 8.42 | | m3 | |
| Software Version | | | | | | | | | |
| Acquisition System | | | | | | Version | | | |
| MaxWell | | | | | | 4.0.9163.3000 | | | |
| Application Patch | | | | | | Patch-SP-10767_13075-4.0.9163.3001 | | | |
| Computation | | Description | | | | | Version | | |
| Borehole | | Borehole Ensemble provides common Borehole Parameters and Channels | | | | | 4.0.9213.3000 | | |
| HENVIR | | Computation Ensemble for the HGNS Neutron environmental corrections | | | | | 4.0.9033.3000 | | |
| DepthCorrection | | DepthCorrection | | | | | 4.0.9213.3000 | | |
| Tool Elements | | Description | | | Software Version | | Firmware Version | | |
| HRCC-H | | HILT High-Resolution Control Cartridge, 150 degC | | | 4.0.9231.3000 | | 2.0 | | |
| HGNS-H | | HILT Gamma-Ray and Neutron Sonde, 150 degC | | | 4.0.9231.3000 | | 2.0 | | |
| HRGD-H | | HILT Resistivity Gamma-Ray Density Device, 150 degC | | | 4.0.9231.3000 | | 3.0 | | |
| Pass Summary | | | | | | | | | |
| Run Name | Pass Objective | Direction | Top | Bottom | Start | Stop | DSC Mode | Depth Shift | Include Parallel Data |
| 1.1 | Log[5]:Up | Up | 543.85 m | 1822.88 m | 14-Jan-2014 6:48:20 PM | 14-Jan-2014 8:17:20 PM | ON | -1.90 m | Yes |
| All depths are referenced to toolstring zero | | | | | | | | | |
| Log | Company:CONOCOPHILLIPS CANADA RESOURCES CORP. | | | | | | Well:COPRC DODO CANYON E76 | | |
| 1.1: Log[5]:Up:S023 | | | | | | | | | |
| Description: MCFL processing LQC for Platform Express Format: Log (NUC-HIRES) Index Scale: 1:120 Index Unit: m Index Type: Measured Depth | | | | | | | | | |
| Creation Date: 15-Jan-2014 01:23:04 | | | | | | | | | |
| Channel | Source | | Sampling | | | | | | |
| BS | Borehole | | 6in | | | | | | |
| CALI.1 | HDRS-H[1]:HRCC-H:HRCC-H | | 1in | | | | | | |
| CALI.2 | HDRS-H[2]:HRCC-H:HRCC-H | | 1in | | | | | | |
| DPHI_SAN.1 | HDRS-H[1]:HRMS-H:HRGD-H | | 2in | | | | | | |
| DPHI_SAN.2 | HDRS-H[2]:HRMS-H:HRGD-H | | 2in | | | | | | |
| GR_CAL | HGNS-H:HGNS-H:HGNS-H | | 2in | | | | | | |
| HDRA | HDRS-H[1]:HRMS-H:HRGD-H | | 2in | | | | | | |
| ICV | Borehole | | 6in | | | | | | |
| IHV | Borehole | | 6in | | | | | | |
| NPOR_SAN | HGNS-H:HGNS-H:HGNS-H | | 6in | | | | | | |
| PEF8 | HDRS-H[1]:HRMS-H:HRGD-H | | 2in | | | | | | |
| STIT | DepthCorrection | | 6in | | | | | | |

TENS WLWorkflow 1in
TIME_1900 0.1in

ICV - Integrated Cement Volume every 0.10 (m3)

TIME_1900 - Time Marked every 60.00 (s)

IHV - Integrated Hole Volume every 1.00 (m3)

IHV - Integrated Hole Volume every 0.10 (m3)

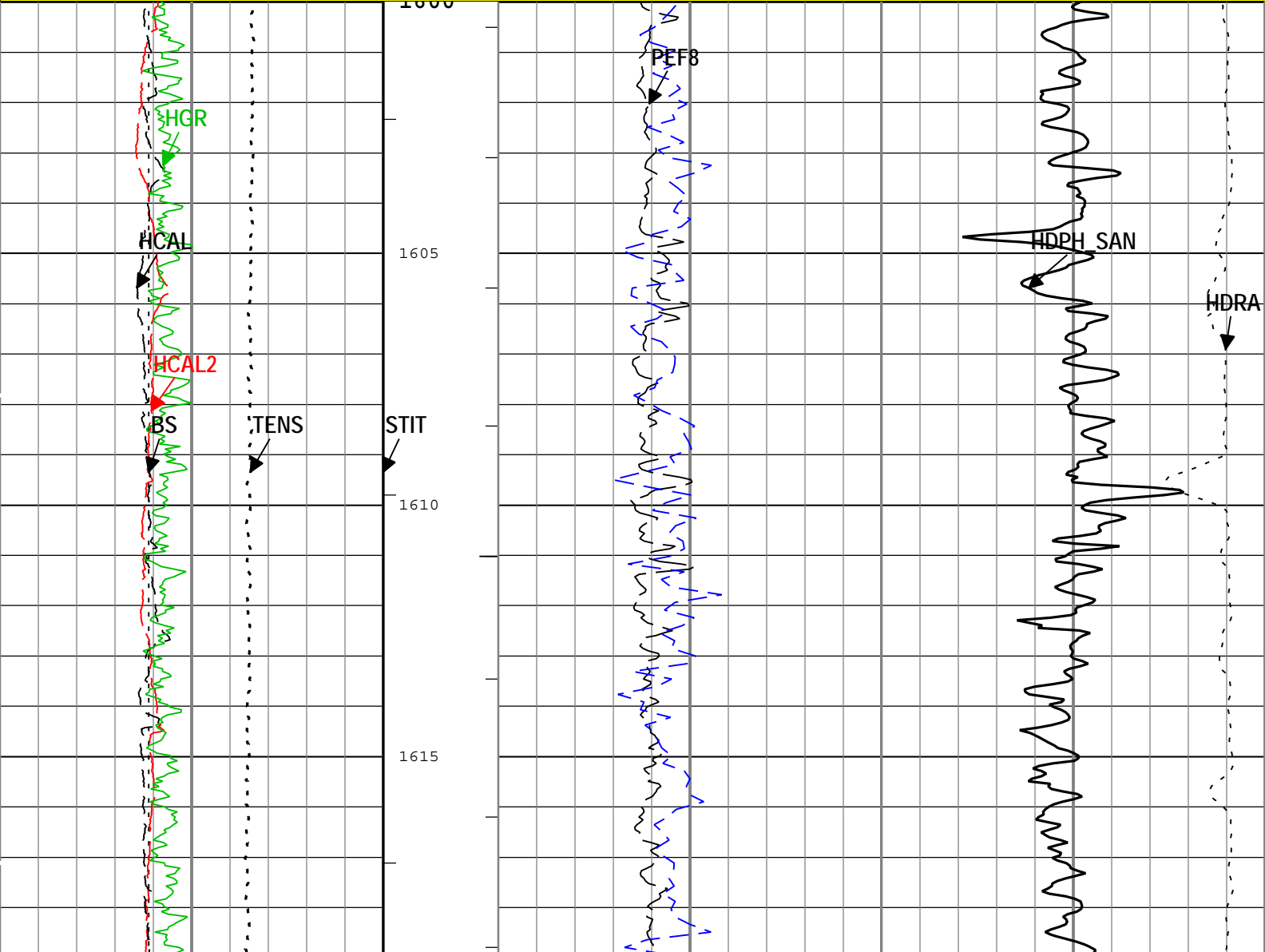
ICV - Integrated Cement Volume every 1.00 (m3)

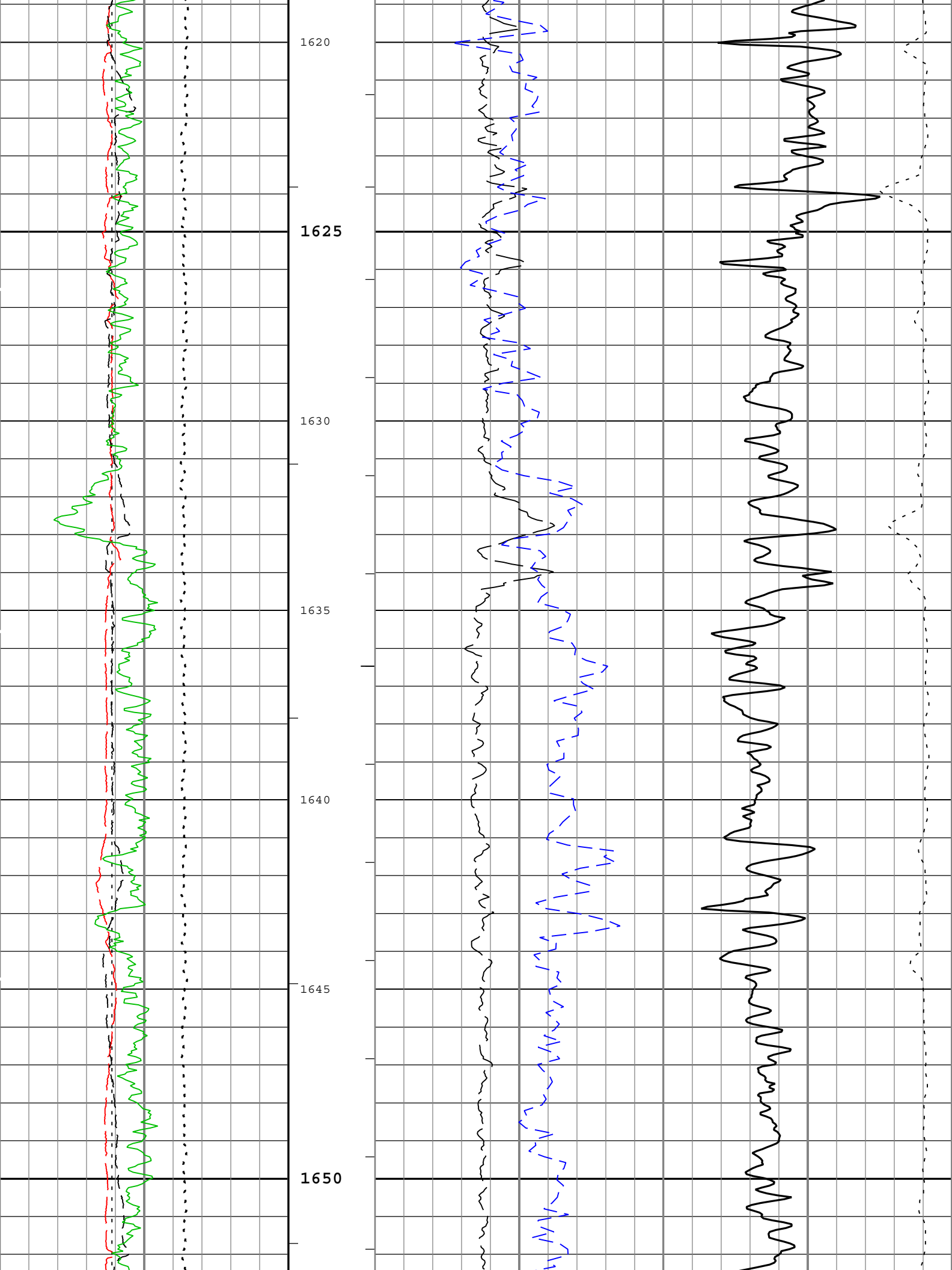
| Cable Tension (TENS) | | |
|----------------------|------|-----|
| 25000 | N | 0 |
| Bit Size (BS) | | |
| 125 | mm | 375 |
| HCAL2 | | |
| 125 | mm | 375 |
| HCAL | | |
| 125 | mm | 375 |
| HGR | | |
| 0 | gAPI | 300 |

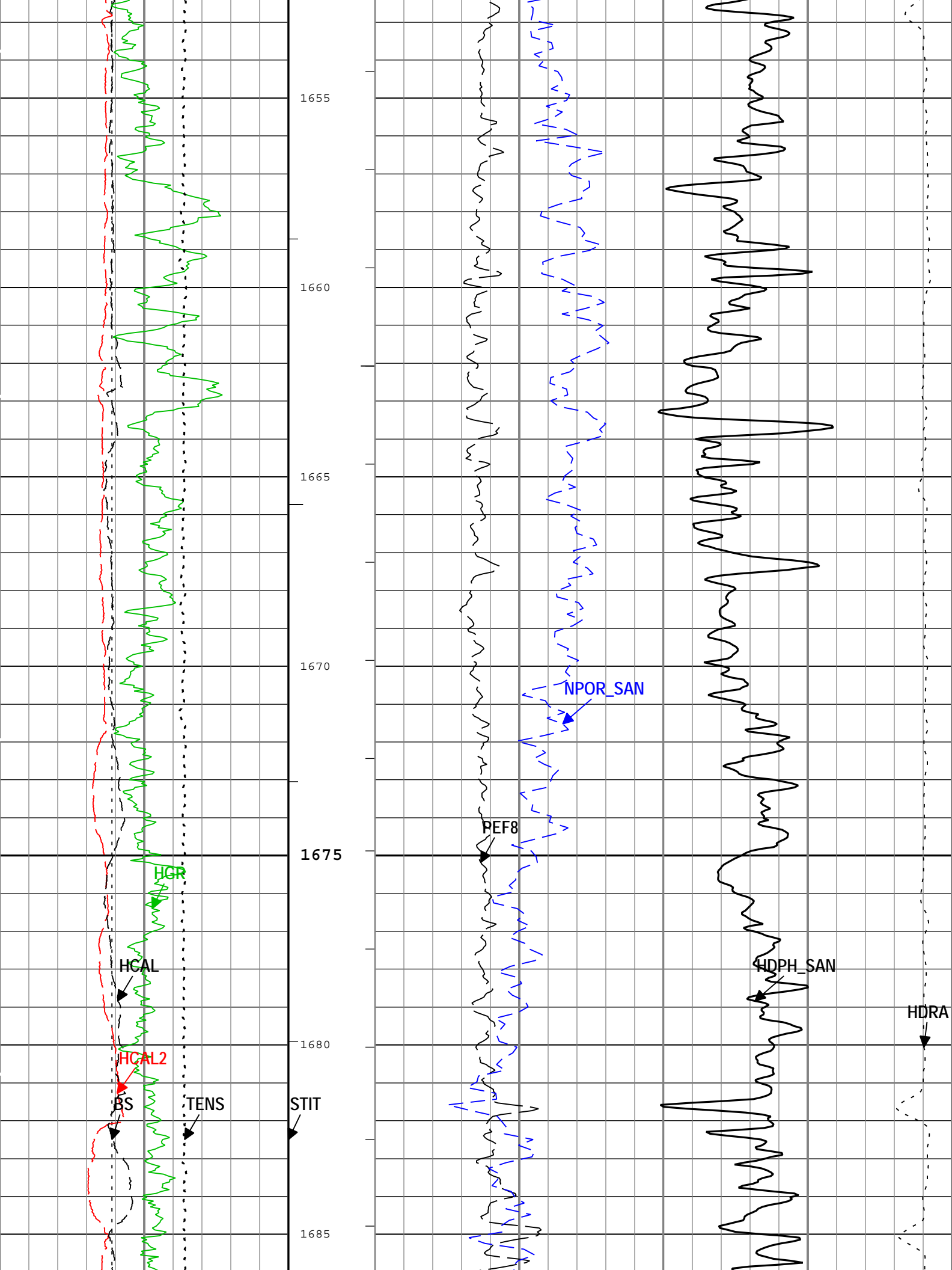
| Density Standoff Correction (HDRA) HDRS-H[1] | | |
|--|-------|-----|
| 200 | kg/m3 | -50 |

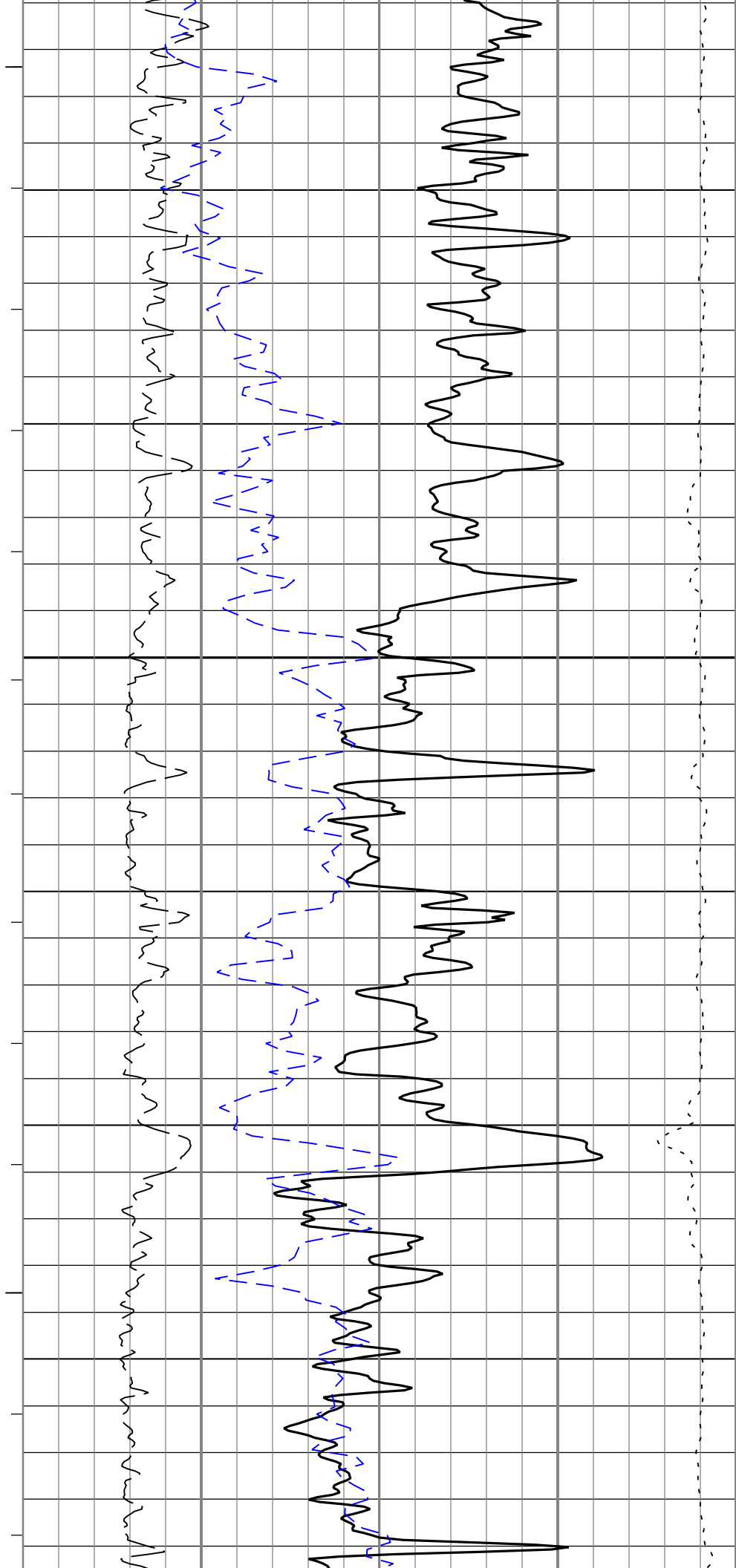
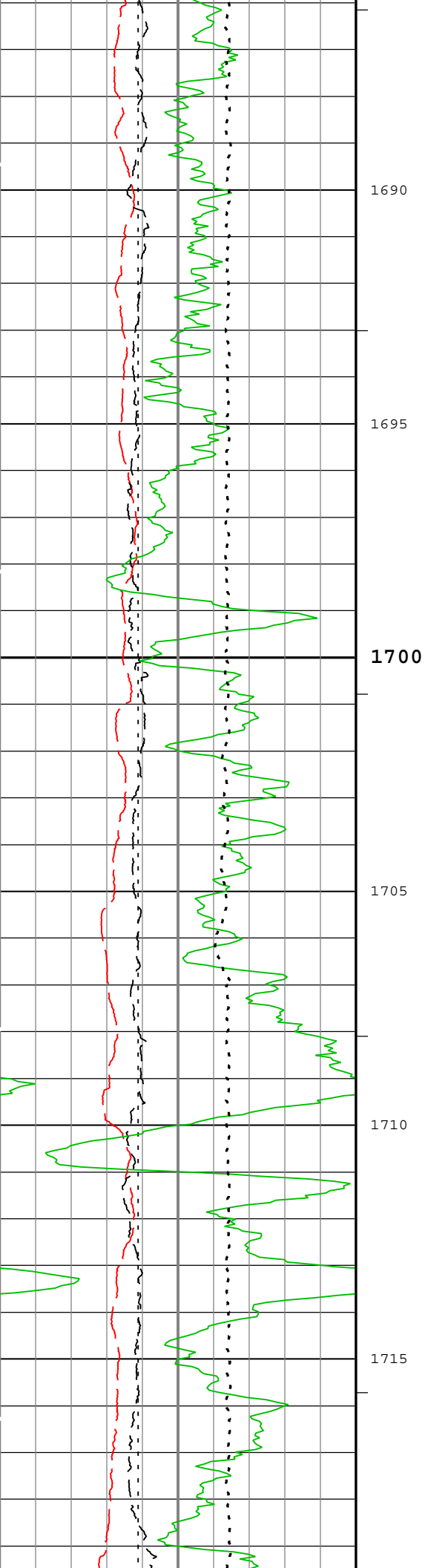
| HDPH_SAN2 | | |
|--|-------|-------|
| 0.45 | m3/m3 | -0.15 |
| HDPH_SAN | | |
| 0.45 | m3/m3 | -0.15 |
| High Resolution Formation Photoelectric Factor (PEF8) HDRS-H[1] | | |
| 0 | | 20 |
| Enhanced Thermal Neutron Porosity (matrix Sandstone) (NPOR_SAN) HGNS-H | | |
| 0.45 | m3/m3 | -0.15 |

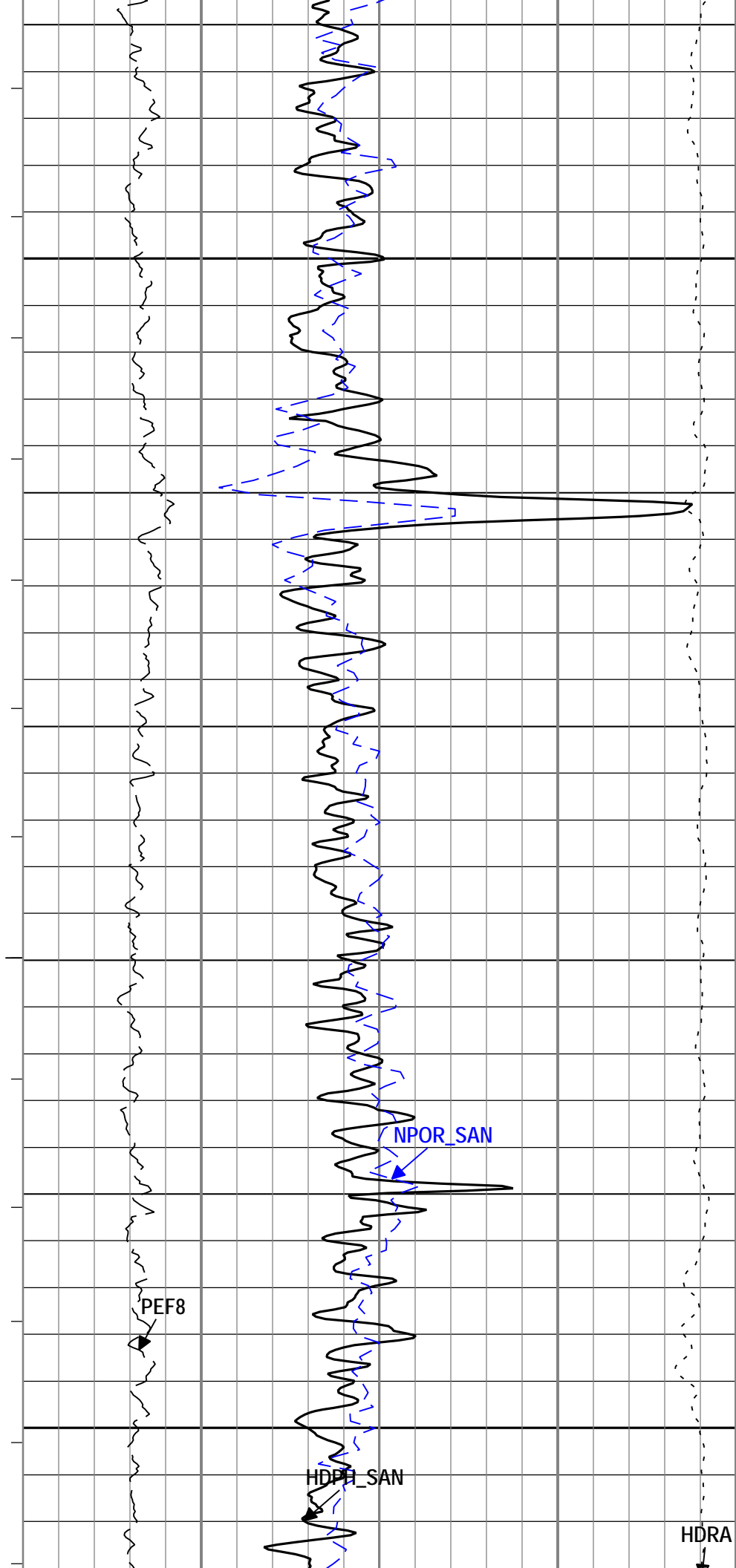
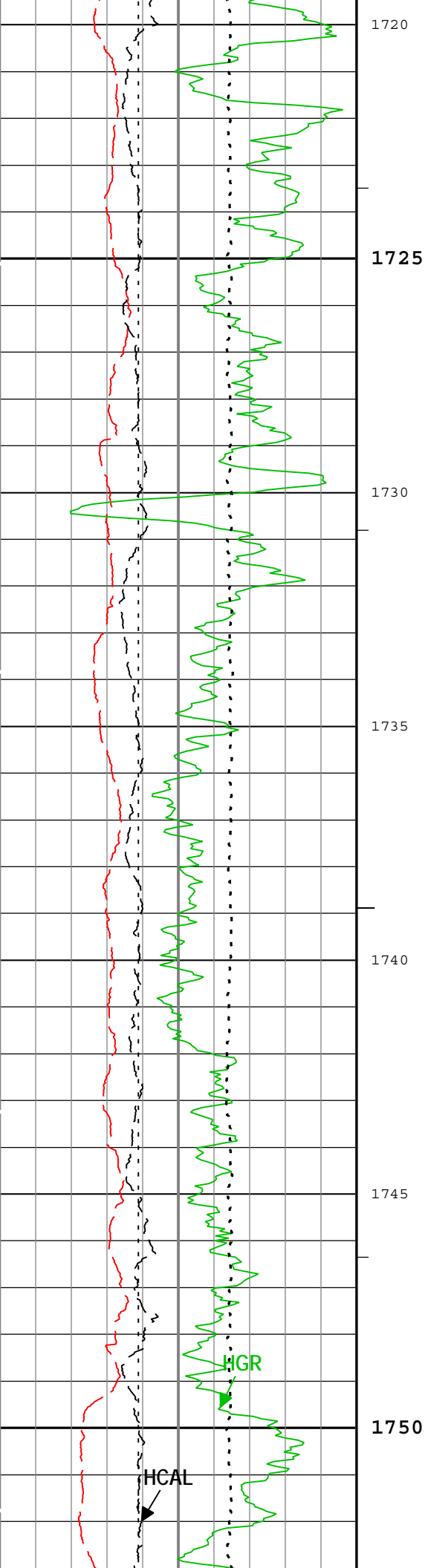
HIGH RESOLUTION PASS: PEX-NEUTRON POROSITY LOG - SANDSTONE 2650 KG/M3

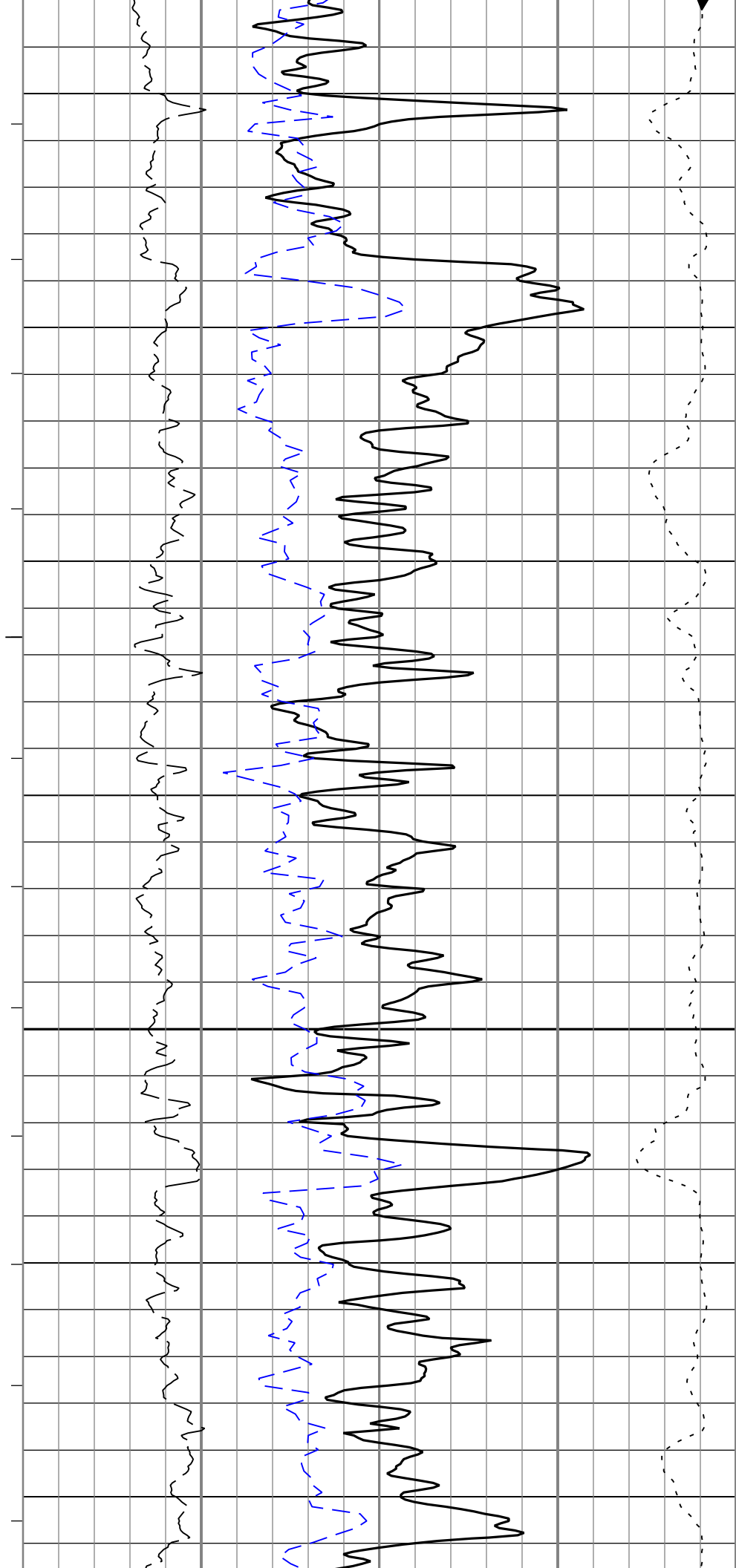
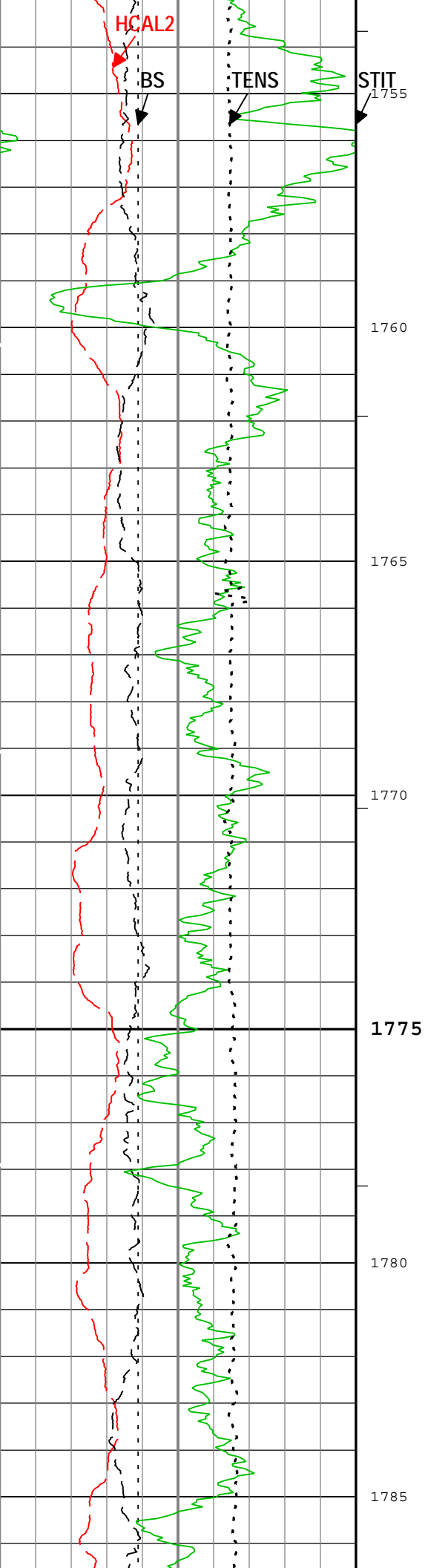


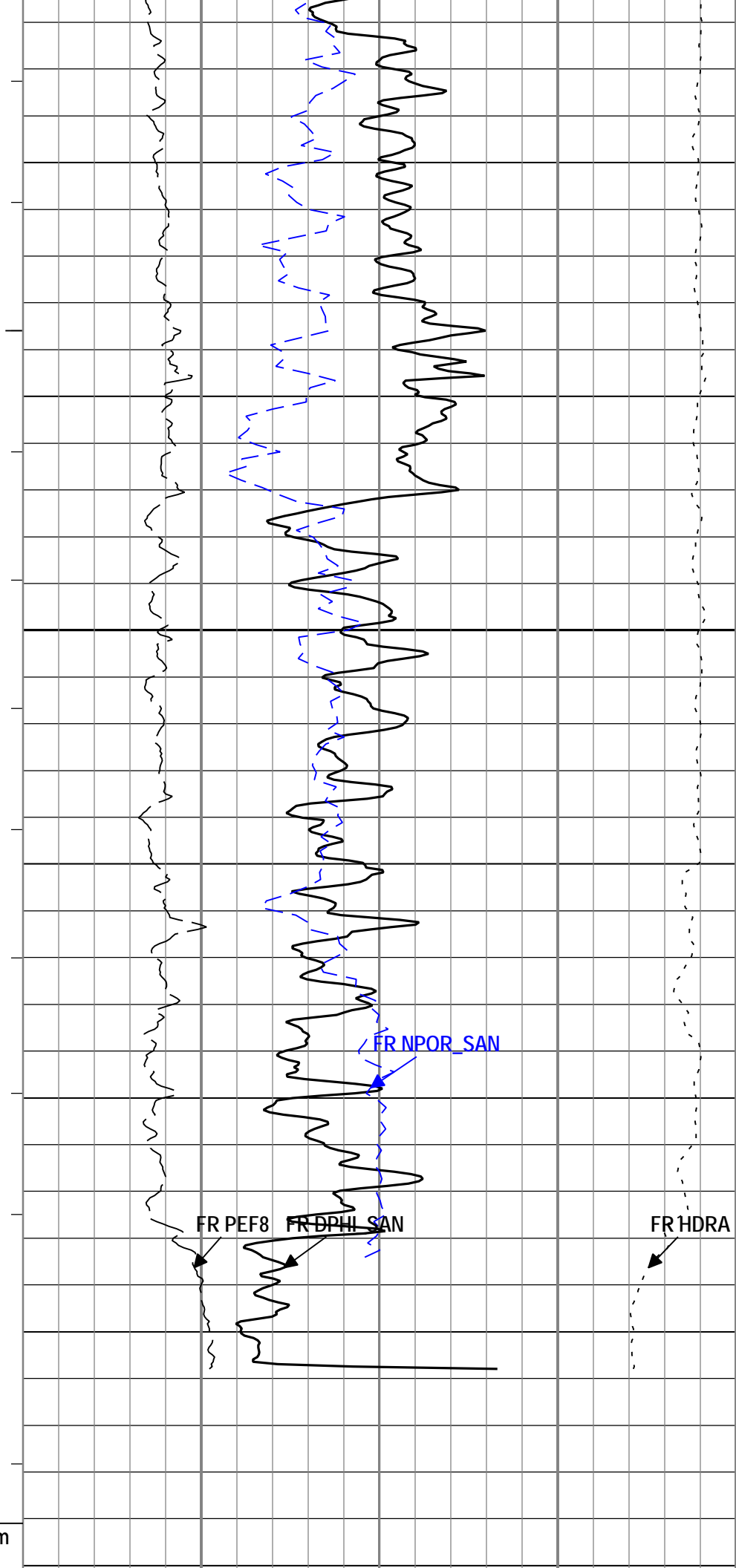
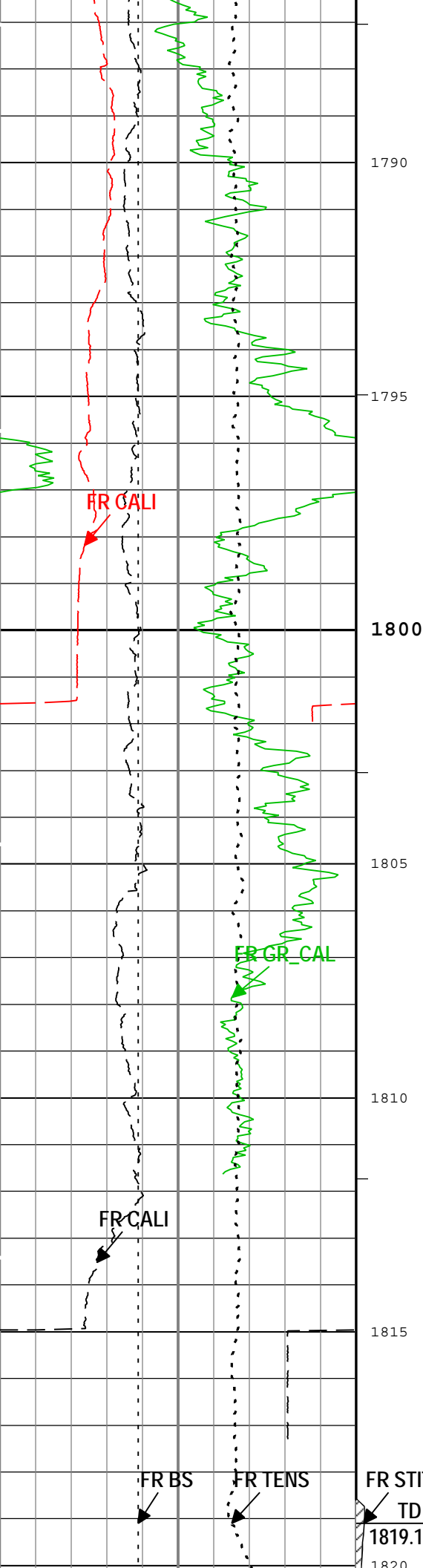


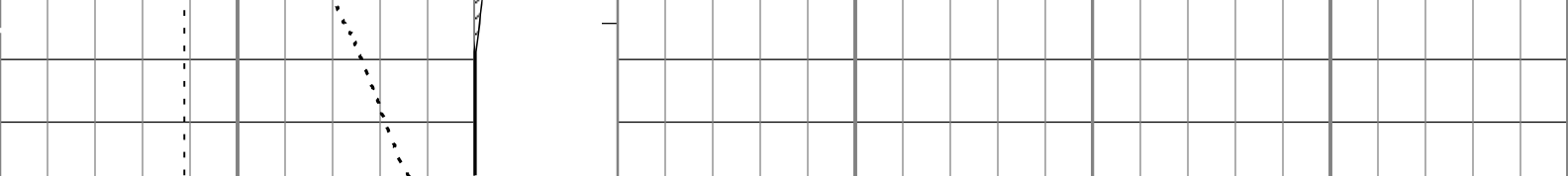












HIGH RESOLUTION PASS: PEX-NEUTRON POROSITY LOG - SANDSTONE 2650 KG/M3

| | | |
|----------------------|------|-----|
| Bit Size (BS) | | |
| 125 | mm | 375 |
| HCAL2 | | |
| 125 | mm | 375 |
| HCAL | | |
| 125 | mm | 375 |
| HGR | | |
| 0 | gAPI | 300 |
| Cable Tension (TENS) | | |
| 25000 | N | 0 |

| | | |
|--|-------|-------|
| HDPH_SAN2 | | |
| 0.45 | m3/m3 | -0.15 |
| HDPH_SAN | | |
| 0.45 | m3/m3 | -0.15 |
| High Resolution Formation Photoelectric Factor (PEF8) HDRS-H[1] | | |
| 0 | | 20 |
| Enhanced Thermal Neutron Porosity (matrix Sandstone) (NPOR_SAN) HGNS-H | | |
| 0.45 | m3/m3 | -0.15 |
| Density Standoff Correction (HDRA) HDRS-H[1] | | |
| 200 | kg/m3 | -50 |

- └─ ICV - Integrated Cement Volume every 1.00 (m3)
 - └─ IHV - Integrated Hole Volume every 0.10 (m3)
 - └─ IHV - Integrated Hole Volume every 1.00 (m3)
- TIME_1900 - Time Marked every 60.00 (s)
- └─ ICV - Integrated Cement Volume every 0.10 (m3)

Description: MCFL processing LOC for Platform Express Format: Log (NUC-HIRES) Index Scale: 1:120 Index Unit: m Index Type: Measured Depth
Creation Date: 15-Jan-2014 01:23:04

| Channel Processing Parameters | | | | |
|-------------------------------|--|-----------------|-----------|-------|
| Parameter | Description | Tool | Value | Unit |
| BARI | Barite Mud Presence Flag | Borehole | No | |
| BHS | Borehole Status (Open or Cased Hole) | Borehole | Open | |
| BHT | Bottom Hole Temperature | Borehole | 71.5 | degC |
| BS | Bit Size | WLSESSION | 222 | mm |
| BSAL | Borehole Salinity | Borehole | 0 | ppm |
| BSCO | Borehole Salinity Correction Option | HGNS-H | No | |
| CALI_SHIFT.1 | CALI Supplementary Offset | HDRS-H | 4.4 | mm |
| CALI_SHIFT.2 | CALI Supplementary Offset | HDRS-H | 13.5 | mm |
| CBLO | Casing Bottom (Logger) | WLSESSION | 603 | m |
| CCCO | Casing & Cement Thickness Correction Option | HGNS-H | Yes | |
| DC_MODE | Depth Correction Mode | DepthCorrection | Real-time | |
| DFD | Drilling Fluid Density | Borehole | 1025 | kg/m3 |
| DFT | Drilling Fluid Type | Borehole | Oil | |
| DHC | Density Hole Correction | HDRS-H | Bit Size | |
| FCD | Future Casing (Outer) Diameter | WLSESSION | 177.8 | mm |
| FD | Fluid Density | Borehole | 1000 | kg/m3 |
| FSAL | Formation Salinity | Borehole | 0 | ppm |
| FSCO | Formation Salinity Correction Option | HGNS-H | No | |
| GCLF | Coal-Like Formation | HDRS-H | No | |
| GCSE_DOWN_PASS | Generalized Caliper Selection for WL Log Down Passes | Borehole | BS | |
| GCSE_UP_PASS | Generalized Caliper Selection for WL Log Up Passes | Borehole | CALI | |
| GR_MULTIPLIER | Gamma Ray Multiplier | HGNS-H | 1 | |

| | | | | |
|------|--|----------|-----------------------|----|
| GRSE | Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity | Borehole | REMS | |
| GTSE | Generalized Temperature Selection, from Measured or Computed Temperature | Borehole | CTEM | |
| HSCO | Hole Size Correction Option | HGNS-H | Yes | |
| HVCS | Integrated Hole Volume Caliper Selection | Borehole | Compute Area from GHD | |
| IHVC | Integrated Hole Volume Control | Borehole | Start | |
| MATR | Rock Matrix for Neutron Porosity Corrections | Borehole | SANDSTONE | |
| MCCO | Mud Cake Correction Option | HGNS-H | No | |
| MWCO | Mud Weight Correction Option | HGNS-H | No | |
| NAAC | Switch for the correction of formation activation by the APS | HDRS-H | Off | |
| NPRM | HRDD Nuclear Processing Mode | HDRS-H | High Resolution | |
| NTCO | HRDD Nuclear Temperature Correction Option | HDRS-H | On | |
| PTCO | Pressure Temperature Correction Option | HGNS-H | No | |
| SOCN | Standoff Distance | HGNS-H | 3.175 | mm |
| SOCO | Standoff Correction Option | HGNS-H | Yes | |
| TD | Total Measured Depth | Borehole | 1819.1 | m |

Tool Control Parameters

| Parameter | Description | Tool | Value | Unit |
|---------------|--|-----------|------------------|------|
| HMCA_BRD_TYPE | HMCA Board Type | HGNS-H | 1 | |
| HRGD_BRD_TYPE | HRGD Board Type | HDRS-H | WITH_HET | |
| MAX_LOG_SPEED | Toolstring Maximum Logging Speed | WLSESSION | 548.64 | m/h |
| NDTC | Nuclear Dead Time Correction | HDRS-H | On | |
| NPUC | Nuclear Pile-Up Correction | HDRS-H | Off | |
| STSO_HRDD | Temperature Source for the Density Algorithm | HDRS-H | HET data channel | |

Calibration Report

| | | | | |
|--|--|------|-----|--|
| AIT-M (Array Induction Tool - M) Calibration - Run 1.1 | | | | |
| Primary Equipment : | | | | |
| File code for AIT-MA Sonde Tool Element | | AMIS | 129 | |
| Auxiliary Equipment : | | | | |
| AITM Rm/SP Bottom Nose | | AMRM | 129 | |

| AIT Sonde Calibration - Test Loop Gain | | | | | | | |
|--|------|----------------------|---------|-----------|--------|------------|--|
| Master (EEPROM): | | 10:28:12 31-Dec-2013 | | | | | |
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| Test Loop Gain - 0 | | Master | 1.000 | 0.950 | 1.014 | 1.050 | |
| Test Loop Phase - 0 | deg | Master | 0 | -3.000 | 1.089 | 3.000 | |
| Test Loop Gain - 1 | | Master | 1.000 | 0.950 | 1.008 | 1.050 | |
| Test Loop Phase - 1 | deg | Master | 0 | -3.000 | 0.684 | 3.000 | |
| Test Loop Gain - 2 | | Master | 1.000 | 0.950 | 1.009 | 1.050 | |
| Test Loop Phase - 2 | deg | Master | 0 | -3.000 | -0.018 | 3.000 | |
| Test Loop Gain - 3 | | Master | 1.000 | 0.950 | 1.004 | 1.050 | |
| Test Loop Phase - 3 | deg | Master | 0 | -3.000 | 0.042 | 3.000 | |
| Test Loop Gain - 4 | | Master | 1.000 | 0.950 | 0.989 | 1.050 | |
| Test Loop Phase - 4 | deg | Master | 0 | -3.000 | 0.028 | 3.000 | |
| Test Loop Gain - 5 | | Master | 1.000 | 0.950 | 0.980 | 1.050 | |
| Test Loop Phase - 5 | deg | Master | 0 | -3.000 | -0.052 | 3.000 | |
| Test Loop Gain - 6 | | Master | 1.000 | 0.950 | 0.987 | 1.050 | |
| Test Loop Phase - 6 | deg | Master | 0 | -3.000 | 0.343 | 3.000 | |
| Test Loop Gain - 7 | | Master | 1.000 | 0.950 | 1.007 | 1.050 | |
| Test Loop Phase - 7 | deg | Master | 0 | -3.000 | 0.019 | 3.000 | |

| AIT Sonde Calibration - Sonde Error Correction | | | | | | | |
|--|------|----------------------|---------|-----------|---------|------------|--|
| Master (EEPROM): | | 10:28:12 31-Dec-2013 | | | | | |
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| Sonde Error Correction Real - 0 | mS/m | Master | ----- | -231.000 | -80.037 | 119.000 | |
| Sonde Error Correction Quad - 0 | | Master | ----- | -2250.000 | -45.287 | 2250.000 | |
| Sonde Error Correction Real - 1 | mS/m | Master | ----- | 114.000 | 162.947 | 204.000 | |

| | | | | | | | |
|---------------------------------|------|--------|-------|----------|---------|---------|--|
| Sonde Error Correction Quad - 1 | mS/m | Master | ----- | -625.000 | 140.227 | 625.000 | |
| Sonde Error Correction Real - 2 | mS/m | Master | ----- | 66.000 | 107.663 | 156.000 | |
| Sonde Error Correction Quad - 2 | | Master | ----- | -350.000 | -65.097 | 350.000 | |
| Sonde Error Correction Real - 3 | mS/m | Master | ----- | 39.000 | 59.198 | 89.000 | |
| Sonde Error Correction Quad - 3 | | Master | ----- | -250.000 | 32.514 | 250.000 | |
| Sonde Error Correction Real - 4 | mS/m | Master | ----- | 15.000 | 25.111 | 35.000 | |
| Sonde Error Correction Quad - 4 | | Master | ----- | -63.000 | 12.558 | 63.000 | |
| Sonde Error Correction Real - 5 | mS/m | Master | ----- | 4.000 | 11.772 | 24.000 | |
| Sonde Error Correction Quad - 5 | | Master | ----- | -50.000 | 12.598 | 50.000 | |
| Sonde Error Correction Real - 6 | mS/m | Master | ----- | 5.000 | 9.450 | 15.000 | |
| Sonde Error Correction Quad - 6 | | Master | ----- | -30.000 | -1.456 | 30.000 | |
| Sonde Error Correction Real - 7 | mS/m | Master | ----- | -5.000 | -1.529 | 5.000 | |
| Sonde Error Correction Quad - 7 | | Master | ----- | -30.000 | -9.453 | 30.000 | |

AIT Mud Calibration - Mud Calibration Gain

| | | | | | | | |
|---------------------------------------|------|--------|---------|-----------|--------|------------|--|
| Master (EEPROM): 10:28:12 31-Dec-2013 | | | | | | | |
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| Coarse Gain | | Master | 1.000 | 0.800 | 0.854 | 1.200 | |
| Fine Gain | | Master | 1.000 | 0.800 | 0.855 | 1.200 | |

AIT Electronics Check - Thru Calibration Check

| | | | | | | | |
|--|------|---------------|---------|-----------|----------|------------|--|
| Master (EEPROM): 10:28:12 31-Dec-2013 Before (Measured): 17:33:23 14-Jan-2014 After: | | | | | | | |
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| Thru Cal Mag - 0 | V | Master | ----- | 0.366 | 0.621 | 0.854 | |
| | | Before | ----- | 0.366 | 0.621 | 0.854 | |
| | | After | ----- | ----- | ----- | ----- | |
| | | Before-Master | ----- | ----- | 0.000 | ----- | |
| | | After-Before | ----- | ----- | ----- | ----- | |
| Thru Cal Phase - 0 | deg | Master | ----- | 137.000 | -174.832 | -103.000 | |
| | | Before | ----- | 137.000 | -166.266 | -103.000 | |
| | | After | ----- | ----- | ----- | ----- | |
| | | Before-Master | ----- | ----- | 8.566 | ----- | |
| | | After-Before | ----- | ----- | ----- | ----- | |
| Thru Cal Mag - 1 | V | Master | ----- | 0.762 | 1.275 | 1.778 | |
| | | Before | ----- | 0.762 | 1.275 | 1.778 | |
| | | After | ----- | ----- | ----- | ----- | |
| | | Before-Master | ----- | ----- | 0.000 | ----- | |
| | | After-Before | ----- | ----- | ----- | ----- | |
| Thru Cal Phase - 1 | deg | Master | ----- | 136.000 | -175.928 | -104.000 | |
| | | Before | ----- | 136.000 | -167.360 | -104.000 | |
| | | After | ----- | ----- | ----- | ----- | |
| | | Before-Master | ----- | ----- | 8.568 | ----- | |
| | | After-Before | ----- | ----- | ----- | ----- | |
| Thru Cal Mag - 2 | V | Master | ----- | 0.372 | 0.632 | 0.868 | |
| | | Before | ----- | 0.372 | 0.632 | 0.868 | |
| | | After | ----- | ----- | ----- | ----- | |
| | | Before-Master | ----- | ----- | 0.000 | ----- | |
| | | After-Before | ----- | ----- | ----- | ----- | |
| Thru Cal Phase - 2 | deg | Master | ----- | 132.000 | -179.506 | -108.000 | |
| | | Before | ----- | 132.000 | -170.938 | -108.000 | |
| | | After | ----- | ----- | ----- | ----- | |
| | | Before-Master | ----- | ----- | 8.568 | ----- | |
| | | After-Before | ----- | ----- | ----- | ----- | |
| Thru Cal Mag - 3 | V | Master | ----- | 0.420 | 0.715 | 0.980 | |
| | | Before | ----- | 0.420 | 0.715 | 0.980 | |
| | | After | ----- | ----- | ----- | ----- | |
| | | Before-Master | ----- | ----- | 0.000 | ----- | |
| | | After-Before | ----- | ----- | ----- | ----- | |
| Thru Cal Phase - 3 | deg | Master | ----- | 131.000 | 179.717 | -109.000 | |
| | | Before | ----- | 131.000 | -171.711 | -109.000 | |
| | | After | ----- | ----- | ----- | ----- | |
| | | Before-Master | ----- | ----- | -351.428 | ----- | |
| | | After-Before | ----- | ----- | ----- | ----- | |
| Thru Cal Mag - 4 | V | Master | ----- | 0.804 | 1.338 | 1.876 | |
| | | Before | ----- | 0.804 | 1.338 | 1.876 | |
| | | After | ----- | ----- | ----- | ----- | |
| | | Before-Master | ----- | ----- | 0.000 | ----- | |
| | | After-Before | ----- | ----- | ----- | ----- | |

| | | | | | | | |
|--------------------|-----|--|---|---|---|---|--|
| Thru Cal Phase - 4 | deg | Master Before After Before-Master After-Before | ----- ----- ----- ----- ----- | 125.000 125.000 ----- ----- ----- | 173.499 -177.921 ----- -351.420 ----- | -115.000 -115.000 ----- ----- ----- | <div><div></div><div></div><div></div><div></div><div></div></div> |
| Thru Cal Mag - 5 | V | Master Before After Before-Master After-Before | ----- ----- ----- ----- ----- | 1.176 1.176 ----- ----- ----- | 1.944 1.943 ----- -0.001 ----- | 2.744 2.744 ----- ----- ----- | <div><div></div><div></div><div></div><div></div><div></div></div> |
| Thru Cal Phase - 5 | deg | Master Before After Before-Master After-Before | ----- ----- ----- ----- ----- | 122.000 122.000 ----- ----- ----- | 171.861 -179.552 ----- -351.413 ----- | -118.000 -118.000 ----- ----- ----- | <div><div></div><div></div><div></div><div></div><div></div></div> |
| Thru Cal Mag - 6 | V | Master Before After Before-Master After-Before | ----- ----- ----- ----- ----- | 1.176 1.176 ----- ----- ----- | 1.941 1.940 ----- -0.001 ----- | 2.744 2.744 ----- ----- ----- | <div><div></div><div></div><div></div><div></div><div></div></div> |
| Thru Cal Phase - 6 | deg | Master Before After Before-Master After-Before | ----- ----- ----- ----- ----- | 121.000 121.000 ----- ----- ----- | 171.902 -179.513 ----- -351.415 ----- | -119.000 -119.000 ----- ----- ----- | <div><div></div><div></div><div></div><div></div><div></div></div> |
| Thru Cal Mag - 7 | V | Master Before After Before-Master After-Before | ----- ----- ----- ----- ----- | 0.846 0.846 ----- ----- ----- | 1.395 1.395 ----- 0.000 ----- | 1.974 1.974 ----- ----- ----- | <div><div></div><div></div><div></div><div></div><div></div></div> |
| Thru Cal Phase - 7 | deg | Master Before After Before-Master After-Before | ----- ----- ----- ----- ----- | 115.000 115.000 ----- ----- ----- | 171.159 179.812 ----- 8.653 ----- | -125.000 -125.000 ----- ----- ----- | <div><div></div><div></div><div></div><div></div><div></div></div> |
| SPA Zero | mV | Master Before After Before-Master After-Before | ----- ----- ----- | -50.000 -50.000 ----- ----- ----- | -0.122 -0.133 ----- -0.011 ----- | 50.000 50.000 ----- ----- ----- | <div><div></div><div></div><div></div><div></div><div></div></div> |
| SPA Plus | mV | Master Before After Before-Master After-Before | ----- ----- ----- | 941.000 941.000 ----- ----- ----- | 990.432 990.105 ----- -0.327 ----- | 1040.000 1040.000 ----- ----- ----- | <div><div></div><div></div><div></div><div></div><div></div></div> |
| Temperature Zero | V | Master Before After Before-Master After-Before | ----- ----- ----- | -0.050 -0.050 ----- ----- ----- | 0.000 0.000 ----- 0.000 ----- | 0.050 0.050 ----- ----- ----- | <div><div></div><div></div><div></div><div></div><div></div></div> |
| Temperature Plus | V | Master Before After Before-Master After-Before | ----- ----- ----- | 0.870 0.870 ----- ----- ----- | 0.917 0.917 ----- 0.000 ----- | 0.960 0.960 ----- ----- ----- | <div><div></div><div></div><div></div><div></div><div></div></div> |

| | | |
|--|---------------|-------|
| HDRS-H[1] (HILT Density and Rxo Sonde, 150 degC) Calibration - Run 1.1 | | |
| Primary Equipment : | | |
| HILT High-Resolution Control Cartridge, 150 degC | HRCC-H | 880 |
| HILT Resistivity Gamma-Ray Density Device, 150 degC | HRGD-H | 4796 |
| Auxiliary Equipment : | | |
| HRDD Backscatter Detector | Backscatter | |
| HRDD Long Spacing Detector | Long Spacing | 28679 |
| HRDD Short Spacing Detector | Short Spacing | |

| | | |
|--|--------|------|
| Cesium 137 Gamma-Ray Logging Source | GSR-J | 5285 |
| HILT High-Resolution Control Cartridge, 150 degC | HRCC-H | 880 |
| HRMS, 125 degC, 10 kpsi | HRMS-B | 894 |

Calibration Parameter :

| | |
|--|-------|
| Small Ring Size (Caliper Calibration Small Ring) | 203.2 |
| Large Ring Size (Caliper Calibration Large Ring) | 304.8 |

HDRS Caliper Calibration - Caliper Accumulations

Before (Measured): 06:27:32 14-Jan-2014

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
|-------------|------|--------|---------|-----------|--------|------------|--|
| Small Ring | mm | Before | 203.2 | 152.4 | 199.0 | 254.0 | |
| Large Ring | mm | Before | 304.8 | 228.6 | 292.0 | 381.0 | |

HDRS Density Calibration - Inversion Results

Master (EEPROM): 12:27:24 24-Dec-2013

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
|---------------|-------|--------|---------|-----------|--------|------------|--|
| Rho Aluminum | kg/m3 | Master | 2596 | 2586 | 2600 | 2606 | |
| Rho Magnesium | kg/m3 | Master | 1686 | 1676 | 1690 | 1696 | |
| Pe Aluminum | | Master | 2.570 | 2.470 | 2.579 | 2.670 | |
| Pe Magnesium | | Master | 2.650 | 2.550 | 2.603 | 2.750 | |

HDRS Density Calibration - Deviation Summary

Master (EEPROM): 12:27:24 24-Dec-2013

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
|----------------------|------|--------|---------|-----------|--------|------------|--|
| BS Average Deviation | % | Master | 0 | -0.6000 | 0.2068 | 0.6000 | |
| BS Max Deviation | % | Master | 0 | -1.6000 | 0.6397 | 1.6000 | |
| SS Average Deviation | % | Master | 0 | -1.0000 | 0.3839 | 1.0000 | |
| SS Max Deviation | % | Master | 0 | -2.5000 | 1.5922 | 2.5000 | |
| LS Average Deviation | % | Master | 0 | -1.5000 | 0.8683 | 1.5000 | |
| LS Max Deviation | % | Master | 0 | -3.5000 | 2.7525 | 3.5000 | |

HDRS Density Calibration - Background Summary

Master (EEPROM): 12:27:24 24-Dec-2013 Before (Measured): 06:28:18 14-Jan-2014

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
|-----------------|------|---------------|---------|-----------|---------|------------|--|
| BS Window Ratio | | Master | 1.0000 | | 0.7364 | | |
| | | Before | 0.7364 | 0.6996 | 0.7419 | 0.7732 | |
| | | Before-Master | ----- | ----- | 0.0055 | ----- | |
| BS Window Sum | 1/s | Master | 1 | | 26467 | | |
| | | Before | 26467 | 25143 | 26655 | 27790 | |
| | | Before-Master | ----- | ----- | 188 | ----- | |
| SS Window Ratio | | Master | 1.0000 | | 0.4815 | | |
| | | Before | 0.4815 | 0.4574 | 0.4769 | 0.5056 | |
| | | Before-Master | ----- | ----- | -0.0046 | ----- | |
| SS Window Sum | 1/s | Master | 1 | | 11894 | | |
| | | Before | 11894 | 11300 | 11857 | 12489 | |
| | | Before-Master | ----- | ----- | -37 | ----- | |
| LS Window Ratio | | Master | 1.0000 | | 0.2994 | | |
| | | Before | 0.2994 | 0.2844 | 0.2975 | 0.3144 | |
| | | Before-Master | ----- | ----- | -0.0019 | ----- | |
| LS Window Sum | 1/s | Master | 1 | | 1353 | | |
| | | Before | 1353 | 1285 | 1341 | 1421 | |
| | | Before-Master | ----- | ----- | -12 | ----- | |

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM): 12:27:24 24-Dec-2013 Before (Measured): 06:28:18 14-Jan-2014

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
|--------------------|------|---------------|---------|-----------|--------|------------|--|
| BS PM High Voltage | V | Master | | 1000 | 1339 | 2400 | |
| | | Before | | 1000 | 1329 | 2400 | |
| | | Before-Master | ----- | -100 | -10 | 100 | |
| SS PM High Voltage | V | Master | | 1000 | 1361 | 2400 | |
| | | Before | | 1000 | 1398 | 2400 | |
| | | Before-Master | ----- | -100 | 37 | 100 | |
| LS PM High Voltage | V | Master | | 1000 | 1321 | 2400 | |
| | | Before | | 1000 | 1343 | 2400 | |
| | | Before-Master | ----- | -100 | 22 | 100 | |

HDRS Density Calibration - Crystal Quality Resolutions

| Master (EEPROM): | | 12:27:24 24-Dec-2013 | | Before (Measured): | | 06:28:18 14-Jan-2014 | |
|-----------------------|------|----------------------|---------|--------------------|--------|----------------------|--|
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| BS Crystal Resolution | % | Master | | 5.00 | 10.60 | 25.00 | |
| | | Before | | 5.00 | 10.44 | 25.00 | |
| | | Before-Master | ---- | -1.00 | -0.16 | 1.00 | |
| SS Crystal Resolution | % | Master | | 5.00 | 9.82 | 20.00 | |
| | | Before | | 5.00 | 10.29 | 20.00 | |
| | | Before-Master | ---- | -1.00 | 0.47 | 1.00 | |
| LS Crystal Resolution | % | Master | | 5.00 | 8.22 | 20.00 | |
| | | Before | | 5.00 | 8.07 | 20.00 | |
| | | Before-Master | ---- | -1.00 | -0.15 | 1.00 | |

HDRS MCFL Calibration - MCFL Accumulations

| Before (Measured): | | 06:24:53 14-Jan-2014 | | | | | |
|---------------------|-------|----------------------|---------|-----------|--------|------------|--|
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| Main Resistivity | ohm.m | Before | 3875 | 3565 | 3839 | 4185 | |
| Deep Resistivity | ohm.m | Before | 3830 | 3524 | 3808 | 4136 | |
| Shallow Resistivity | ohm.m | Before | 3830 | 3524 | 3810 | 4136 | |

HGNS-H (HILT Gamma-Ray and Neutron Sonde, 150 degC) Calibration - Run 1.1

| | | | |
|--|---------|------|--|
| Primary Equipment : | | | |
| HILT Gamma-Ray and Neutron Sonde, 150 degC | HGNS-H | 4792 | |
| Auxiliary Equipment : | | | |
| HGNS Accelerometer, 150 degC | HACCZ-H | 5469 | |
| AmBe Neutron Logging Source | NSR-F | 2516 | |
| Calibration Parameter : | | | |
| Water Temperature | | | |
| Housing Size | | | |
| JIG-BKG (Jig minus background reference) | 165 | | |

HGNS Accelerometer Calibration - Accelerometer Accumulations





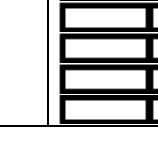
| Before (Measured): | | 17:31:34 14-Jan-2014 | | | | | |
|-------------------------|------|----------------------|---------|-----------|--------|------------|--|
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| AZ Vertical Measurement | m/s2 | Before | 9.81 | 9.61 | 9.81 | 10.01 | |

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read




| Master (EEPROM): | | 00:00:00 15-Sep-2006 | | | | | |
|-------------------------------------|------|----------------------|---------|-----------|----------|------------|--|
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| Accelerometer Manufacturer | | Master | | | QAT_160 | | |
| Accelerometer Reference Temperature | degC | Master | | -1.0 | 25.0 | 50.0 | |
| Accelerometer Coefficients - 0 | | Master | ---- | ---- | 7241.000 | ---- | |
| Accelerometer Coefficients - 1 | | Master | ---- | ---- | 5.473 | ---- | |
| Accelerometer Coefficients - 2 | | Master | ---- | ---- | -0.012 | ---- | |
| Accelerometer Coefficients - 3 | | Master | ---- | ---- | 0.000 | ---- | |
| Accelerometer Coefficients - 4 | | Master | ---- | ---- | 2.735 | ---- | |
| Accelerometer Coefficients - 5 | | Master | ---- | ---- | 0.000 | ---- | |
| Accelerometer Coefficients - 6 | | Master | ---- | ---- | 0.000 | ---- | |
| Accelerometer Coefficients - 7 | | Master | ---- | ---- | 0.000 | ---- | |
| Accelerometer Coefficients - 8 | | Master | ---- | ---- | 300.400 | ---- | |
| Accelerometer Coefficients - 9 | | Master | ---- | ---- | 0.984 | ---- | |

HGNS Neutron Calibration - HGNS Neutron Accumulations

| Master (EEPROM): | | 09:05:16 31-Dec-2013 | | Before (Measured): | | 06:25:14 14-Jan-2014 | | After: | |
|-----------------------|------|----------------------|---------|--------------------|--------|----------------------|--|--------|--|
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | | | |
| Near Zero Measurement | 1/s | Master | 0 | 5.0 | 27.0 | 40.0 | | | |
| | | Before | 0 | 5.0 | 27.3 | 40.0 | | | |
| | | After | ---- | ---- | ---- | ---- | | | |
| | | Before-Master | ---- | -4.1 | 0.3 | 4.1 | | | |
| | | After-Before | ---- | ---- | ---- | ---- | | | |
| Far Zero Measurement | 1/s | Master | 0 | 5.0 | 26.1 | 40.0 | | | |
| | | Before | 0 | 5.0 | 28.5 | 40.0 | | | |
| | | After | ---- | ---- | ---- | ---- | | | |

| | | Before-Master After-Before | ----- ----- | -3.9 ----- | 2.4 ----- | 3.9 ----- |  |
|---------------------------------|-----|--|--|--|--|--|---|
| Near Plus Measurement | 1/s | Master Before After Before-Master After-Before | 6031.0 ----- ----- ----- ----- | 4700.0 ----- ----- ----- ----- | 5851.0 ----- ----- ----- ----- | 6900.0 ----- ----- ----- ----- |  |
| Far Plus Measurement | 1/s | Master Before After Before-Master After-Before | 2793.0 ----- ----- ----- ----- | 1900.0 ----- ----- ----- ----- | 2454.0 ----- ----- ----- ----- | 2900.0 ----- ----- ----- ----- |  |
| Near Corrected Plus Measurement | 1/s | Master Before After Before-Master After-Before | ----- ----- ----- ----- | 4700.0 ----- ----- ----- ----- | 5865.0 ----- ----- ----- ----- | 6900.0 ----- ----- ----- ----- |  |
| Far Corrected Plus Measurement | 1/s | Master Before After Before-Master After-Before | ----- ----- ----- ----- | 1900.0 ----- ----- ----- ----- | 2454.0 ----- ----- ----- ----- | 2900.0 ----- ----- ----- ----- |  |

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

| Before (Measured): | | 06:27:38 14-Jan-2014 | | After: | | | |
|----------------------|------|----------------------|---------|-----------|----------|------------|---|
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| RGR Zero Measurement | gAPI | Before | 30.0 | 0 | 33.9 | 120.0 |  |
| | | After | ---- | ---- | ---- | ---- | |
| | | After-Before | ---- | ---- | ---- | ---- | |
| RGR Plus Measurement | gAPI | Before | 185.4 | 157.1 | 159.9 | 206.3 |  |
| | | After | ---- | ---- | NOT DONE | ---- | |
| | | After-Before | ---- | ---- | ---- | ---- | |
| GR Calibration Gain | | Before | 0.89 | 0.80 | 1.03 | 1.05 |  |
| | | After | ---- | ---- | ---- | ---- | |
| | | After-Before | ---- | ---- | ---- | ---- | |

DSLT-H (Digitizing Sonic Logging Tool - H) Calibration - Run 1.1

Primary Equipment :

Sonic Logging Sonde E supports 3'-5'BHC DT and CBI/VDI

SI S-F

2047

CBL Normalization - CBL Accumulations

Master:

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | | |
|------------------------------|------|--------|---------|-----------|--------|------------|--|--|
| Upper Far Amplitude - 0 | | Master | ---- | ---- | ---- | ---- | | |
| Upper Near Raw Amplitude - 0 | mV | Master | ---- | ---- | ---- | ---- | | |
| Lower Far Amplitude - 0 | | Master | ---- | ---- | ---- | ---- | | |
| Lower Near Raw Amplitude - 0 | mV | Master | ---- | ---- | ---- | ---- | | |

CBL Normalization - CBL/VDL Coefficients

Master:

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
|---|------|--------|---------|-----------|----------|------------|--|
| CBL Correction Factor for UT | | Master | 3.500 | 2.700 | NOT DONE | 4.300 | |
| CBL Correction Factor for LT | | Master | 2.500 | 1.700 | NOT DONE | 4.300 | |
| VDL Ratio between UT and LT for CBLB Mode | | Master | 1.000 | | NOT DONE | | |

CBL Free Pipe Adjustment - Free Pipe Measurement

Before:

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | | |
|------------------------------------|------|--------|---------|-----------|--------|------------|--|--|
| CBL Amplitude - 0 | mV | Before | ---- | ---- | ---- | ---- | | |
| CBL Reference Amplitude (CBRA) - 0 | mV | Before | ---- | ---- | ---- | ---- | | |
| Measurement Depth - 0 | m | Before | ---- | ---- | ---- | ---- | | |

CBL Free Pipe Adjustment - CBL Amplitude Coefficient

Before:

| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | | |
|-----------------------------|------|--------|---------|-----------|----------|------------|--|--|
| CBL Adjustment Factor | | Before | 1.000 | 0.200 | NOT DONE | 5.000 | | |
| Depth of Before Calibration | ft | Before | | | NOT DONE | | | |

HDRS-H[2] (HILT Density and Rxo Sonde, 150 degC) Calibration - Run 1.1

| | | | |
|---|---------------|-------|--|
| Primary Equipment : | | | |
| HILT High-Resolution Control Cartridge, 150 degC | HRCC-H | | |
| HILT Resistivity Gamma-Ray Density Device, 150 degC | HRGD-H | 3914 | |
| Auxiliary Equipment : | | | |
| HRDD Backscatter Detector | Backscatter | | |
| HRDD Long Spacing Detector | Long Spacing | 28710 | |
| HRDD Short Spacing Detector | Short Spacing | 27760 | |
| Cesium 137 Gamma-Ray Logging Source | GSR-J | 5310 | |
| HILT High-Resolution Control Cartridge, 150 degC | HRCC-H | | |
| HILT High-Resolution Mechanical Sonde, 150 degC | HRMS-H | 3875 | |
| Calibration Parameter : | | | |
| Small Ring Size (Caliper Calibration Small Ring) | 203.2 | | |
| Large Ring Size (Caliper Calibration Large Ring) | 304.8 | | |

HDRS Caliper Calibration - Caliper Accumulations

| | | | | | | | |
|--------------------|------|----------------------|---------|-----------|--------|------------|--|
| Before (Measured): | | 06:29:21 14-Jan-2014 | | | | | |
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| Small Ring | mm | Before | 203.2 | 152.4 | 204.6 | 254.0 | |
| Large Ring | mm | Before | 304.8 | 228.6 | 313.3 | 381.0 | |

HDRS Density Calibration - Inversion Results

| | | | | | | | |
|------------------|-------|----------------------|---------|-----------|--------|------------|--|
| Master (EEPROM): | | 10:28:40 24-Dec-2013 | | | | | |
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| Rho Aluminum | kg/m3 | Master | 2596 | 2586 | 2598 | 2606 | |
| Rho Magnesium | kg/m3 | Master | 1686 | 1676 | 1690 | 1696 | |
| Pe Aluminum | | Master | 2.570 | 2.470 | 2.568 | 2.670 | |
| Pe Magnesium | | Master | 2.650 | 2.550 | 2.615 | 2.750 | |

HDRS Density Calibration - Deviation Summary

| | | | | | | | |
|----------------------|------|----------------------|---------|-----------|--------|------------|--|
| Master (EEPROM): | | 10:28:40 24-Dec-2013 | | | | | |
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| BS Average Deviation | % | Master | 0 | -0.6000 | 0.2310 | 0.6000 | |
| BS Max Deviation | % | Master | 0 | -1.6000 | 0.8128 | 1.6000 | |
| SS Average Deviation | % | Master | 0 | -1.0000 | 0.6214 | 1.0000 | |
| SS Max Deviation | % | Master | 0 | -2.5000 | 1.9703 | 2.5000 | |
| LS Average Deviation | % | Master | 0 | -1.5000 | 0.3753 | 1.5000 | |
| LS Max Deviation | % | Master | 0 | -3.5000 | 1.3653 | 3.5000 | |

HDRS Density Calibration - Background Summary

| | | | | | | | | | |
|------------------|------|----------------------|---------|--------------------|---------|----------------------|--|-------------------|--|
| Master (EEPROM): | | 10:28:40 24-Dec-2013 | | Before (Measured): | | 14:51:08 09-Jan-2014 | | Expired by 4 days | |
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | | | |
| BS Window Ratio | | Master | 1.0000 | | 0.7406 | | | | |
| | | Before | 0.7406 | 0.7036 | 0.7452 | 0.7776 | | | |
| | | Before-Master | ----- | ----- | 0.0046 | ----- | | | |
| BS Window Sum | 1/s | Master | 1 | | 23979 | | | | |
| | | Before | 23979 | 22780 | 24136 | 25178 | | | |
| | | Before-Master | ----- | ----- | 157 | ----- | | | |
| SS Window Ratio | | Master | 1.0000 | | 0.4809 | | | | |
| | | Before | 0.4809 | 0.4569 | 0.4768 | 0.5050 | | | |
| | | Before-Master | ----- | ----- | -0.0041 | ----- | | | |
| SS Window Sum | 1/s | Master | 1 | | 10589 | | | | |
| | | Before | 10589 | 10060 | 10583 | 11119 | | | |
| | | Before-Master | ----- | ----- | -6 | ----- | | | |
| LS Window Ratio | | Master | 1.0000 | | 0.3042 | | | | |
| | | Before | 0.3042 | 0.2890 | 0.2988 | 0.3194 | | | |
| | | Before-Master | ----- | ----- | -0.0054 | ----- | | | |
| LS Window Sum | 1/s | Master | 1 | | 1192 | | | | |
| | | Before | 1192 | 1132 | 1180 | 1251 | | | |
| | | Before-Master | ----- | ----- | -12 | ----- | | | |

HDRS Density Calibration - Photo-multiplier High Voltages

| Master (EEPROM): | | 10:28:40 24-Dec-2013 | | Before (Measured): | | 14:51:08 09-Jan-2014 Expired by 4 days | |
|--------------------|------|----------------------|---------|--------------------|--------|--|--|
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| BS PM High Voltage | V | Master | | 1000 | 1448 | 2400 | |
| | | Before | | 1000 | 1447 | 2400 | |
| | | Before-Master | ---- | -100 | -1 | 100 | |
| SS PM High Voltage | V | Master | | 1000 | 1477 | 2400 | |
| | | Before | | 1000 | 1506 | 2400 | |
| | | Before-Master | ---- | -100 | 29 | 100 | |
| LS PM High Voltage | V | Master | | 1000 | 1289 | 2400 | |
| | | Before | | 1000 | 1286 | 2400 | |
| | | Before-Master | ---- | -100 | -3 | 100 | |

| HDRS Density Calibration - Crystal Quality Resolutions | | | | | | | |
|--|------|----------------------|---------|--------------------|--------|--|--|
| Master (EEPROM): | | 10:28:40 24-Dec-2013 | | Before (Measured): | | 14:51:08 09-Jan-2014 Expired by 4 days | |
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| BS Crystal Resolution | % | Master | | 5.00 | 10.46 | 25.00 | |
| | | Before | | 5.00 | 10.41 | 25.00 | |
| | | Before-Master | ---- | -1.00 | -0.05 | 1.00 | |
| SS Crystal Resolution | % | Master | | 5.00 | 10.04 | 20.00 | |
| | | Before | | 5.00 | 10.64 | 20.00 | |
| | | Before-Master | ---- | -1.00 | 0.60 | 1.00 | |
| LS Crystal Resolution | % | Master | | 5.00 | 8.04 | 20.00 | |
| | | Before | | 5.00 | 8.03 | 20.00 | |
| | | Before-Master | ---- | -1.00 | -0.01 | 1.00 | |

| HDRS MCFL Calibration - MCFL Accumulations | | | | | | | |
|--|-------|----------------------|---------|-----------|--------|------------|--|
| Before (Measured): | | 06:25:34 14-Jan-2014 | | | | | |
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| Main Resistivity | ohm.m | Before | 3875 | 3565 | 3906 | 4185 | |
| Deep Resistivity | ohm.m | Before | 3830 | 3524 | 3827 | 4136 | |
| Shallow Resistivity | ohm.m | Before | 3830 | 3524 | 3837 | 4136 | |

| SGT-N (Scintillation Gamma-Ray Tool) Calibration - Run 1.1 | | | |
|--|--------|-------|--|
| Primary Equipment : | | | |
| Scintillation Gamma Cartridge | SGC-TB | 10447 | |
| Calibration Parameter : | | | |
| Plus Reference (Jig minus background reference) | 165 | | |

| SGT-N Gamma-Ray Calibration - Gamma Ray Coefficients | | | | | | | |
|--|------|----------------------|---------|-----------|--------|------------|--|
| Before (Measured): | | 06:28:02 14-Jan-2014 | | After: | | | |
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| Gamma Ray Gain | | Before | | | 1.169 | | |
| | | After | ---- | ---- | ---- | ---- | |
| | | After-Before | ---- | ---- | ---- | ---- | |

| SGT-N Gamma-Ray Calibration - Gamma Ray Accumulations | | | | | | | |
|---|------|----------------------|---------|-----------|----------|------------|--|
| Before (Measured): | | 06:28:02 14-Jan-2014 | | After: | | | |
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| RGR Zero Measurement | gAPI | Before | | 0 | 44.958 | 120.000 | |
| | | After | ---- | ---- | ---- | ---- | |
| | | After-Before | ---- | ---- | ---- | ---- | |
| RGR Plus Measurement | gAPI | Before | 141.161 | 128.328 | 141.161 | 153.994 | |
| | | After | | | NOT DONE | | |
| | | After-Before | ---- | ---- | ---- | ---- | |

| SGT-N Gamma-Ray Plateau Check - Gamma Ray Plateau Check | | | | | | | |
|---|------|----------------------|---------|-----------|---------|------------|--|
| Before (Measured): | | 14:58:24 09-Jan-2014 | | After: | | | |
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| RGR Plus Plateau Measurement | gAPI | Before | | | 173.529 | | |
| | | After | ---- | ---- | ---- | ---- | |
| | | After-Before | ---- | ---- | ---- | ---- | |
| RGR Minus Plateau Measurement | gAPI | Before | | | 170.096 | | |
| | | After | ---- | ---- | ---- | ---- | |
| | | After-Before | ---- | ---- | ---- | ---- | |

LEH QT (Logging Equipment Used - QT 2 3/8 inch 21 pin LHBT with Tension Sensor) Calibration - Run

LEH-QT (Logging Equipment Head - QT, 3-3/8 inch 31 pin HPHT with Tension Sensor) Calibration - Run 1.1

| | | | | | | | |
|---|--|--|--|--------|------|--|--|
| Primary Equipment : | | | | | | | |
| Logging Equipment Head - QT, 3-3/8 inch 31 pin HPHT with Tension Sensor | | | | LEH-QT | 2850 | | |

HTEN Master Calibration - HTEN Master Calibration

| | | | | | | | |
|------------------|------|--------|---------|-----------|----------|------------|--|
| Master: | | | | | | | |
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| HTEN Shop Gain | | Master | 1.000 | 0.800 | NOT DONE | 4.500 | |
| HTEN Shop Offset | lbf | Master | 0 | -4448.222 | NOT DONE | 4448.222 | |

HTEN Before Calibration - HTEN Before Calibration

| | | | | | | | |
|---------------------------|------|--------|---------|-----------|--------|------------|--|
| Before: | | | | | | | |
| Measurement | Unit | Phase | Nominal | Low Limit | Actual | High Limit | |
| RHTE Zero Measurement - 0 | lbf | Before | ---- | ---- | ---- | ---- | |
| RHTE Plus Measurement - 0 | lbf | Before | ---- | ---- | ---- | ---- | |
| HTEN Gain - 0 | | Before | ---- | ---- | ---- | ---- | |
| HTEN Offset - 0 | lbf | Before | ---- | ---- | ---- | ---- | |

Company: CONOCOPHILLIPS CANADA RESOURCES CORP

Schlumberger

Well: COPRC DODO CANYON E76

Field: DODO CANYON

Province: NORTHWEST TERRITORIES

PLATFORM EXPRESS ***MD***

COMPENSATED NEUTRON

DUAL LITHOLOGY DENSITY LOG