

**Company: Lamont Doherty**

**Well: Expedition 339, Site U1391 WI-01B**

**Field: Mediterranean Outflow (Portugal)**

**Rig: JOIDES Resolution Ocean: Atlantic**

## High Resolution Laterolog Array Log Quality Control Log

Rig: JOIDES Resolution  
 Field: Mediterranean Outflow (Portugal)  
 Location: Latitude: N 37° 21.54'  
 Well: Expedition 339, Site U1391 WI-01B  
 Company: Lamont Doherty

<b>LOCATION</b>		Latitude: N 37° 21.54'	Elev.: K.B. 11.00 m
		Longitude: W 9° 24.66'	G.L. -1074.00 m
			D.F. 11.00 m
Permanent Datum:	Mean Sea Level	Elev.: 0.00 m	
Log Measured From:	Drill Floor	11.00 m	above Perm. Datum
Drilling Measured From:	Drill Floor		
API Serial No.		N 37° 21.54'	W 9° 24.66'

Logging Date	15-Jan-2012	
Run Number	1	
Depth Driller	671 m	
Schlumberger Depth	667 m	
Bottom Log Interval	667 m	
Top Log Interval	0 m	
Casing Driller Size @ Depth	10.750 in	@ 99 m
Casing Schlumberger	97 m	
Bit Size	9.875 in	
Type Fluid In Hole	Seawater Gel	
Density	1.25 g/cm3	
Fluid Loss	PH	
Source Of Sample	N/A	
RM @ Measured Temperature	@	@
RMF @ Measured Temperature	@	@
RMC @ Measured Temperature	@	@
Source RMF	RMC	N/A
RM @ MRT	RMF @ MRT	
	@ 21	@ 21
Maximum Recorded Temperatures	21 degC	
Circulation Stopped	Time	0:00
Logger On Bottom	Time	5:04
Unit Number	625003	Houston
Recorded By	K. Swain	
Witnessed By	T. Williams, J. Lofi	

	Run 1	Run 2	
Logging Date			
Run Number			
Depth Driller			
Schlumberger Depth			
Bottom Log Interval			
Top Log Interval			
Casing Driller Size @ Depth	@		
Casing Schlumberger			
Bit Size			
Type Fluid In Hole			
Density			
Fluid Loss	PH		
Source Of Sample			
RM @ Measured Temperature	@	@	
RMF @ Measured Temperature	@	@	
RMC @ Measured Temperature	@	@	
Source RMF	RMC		
RM @ MRT	RMF @ MRT		
	@	@	
Maximum Recorded Temperatures			
Circulation Stopped	Time		
Logger On Bottom	Time		
Unit Number			
Recorded By			
Witnessed By			

**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 OF 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.

**OTHER SERVICES1**  
 OS1: FMS/DSI  
 OS2:  
 OS3:  
 OS4:  
 OS5:

**OTHER SERVICES2**  
 OS1:  
 OS2:  
 OS3:  
 OS4:  
 OS5:

**REMARKS: RUN NUMBER 1**  
 Hole WI-01B Hole C was drilled with a 9 7/8" RCB bit to TDD of 671.5 mbsf.  
 This log originally acquired in measured depth from rig floor but played back for sea floor reference.  
 Playback used LCAL and barite for processing with recompute for Playback.  
 The original logs were acquired with bit size as the hole size assumption.  
 All logs recorded via wireline thru 5-5.5" drillpipe and RCB coring BHA consisting of a bit release sub, Kinley sub, drill collars. Drill bit dropped prior to logging.  
 Remarks on flipped downlog show spiking on HRLA curves. The spiking is due to a tool return problem and not formation.  
 A return/ground problem close to the drill pipe is showing up as noise on the HRLA curves close by the drill pipe.

**REMARKS: RUN NUMBER 2**

RUN 1		
SERVICE ORDER #:		
PROGRAM VERSION:	19C0-187	
FLUID LEVEL:		
LOGGED INTERVAL	START	STOP

RUN 2		
SERVICE ORDER #:		
PROGRAM VERSION:		
FLUID LEVEL:		
LOGGED INTERVAL	START	STOP

## EQUIPMENT DESCRIPTION




**RUN 1**

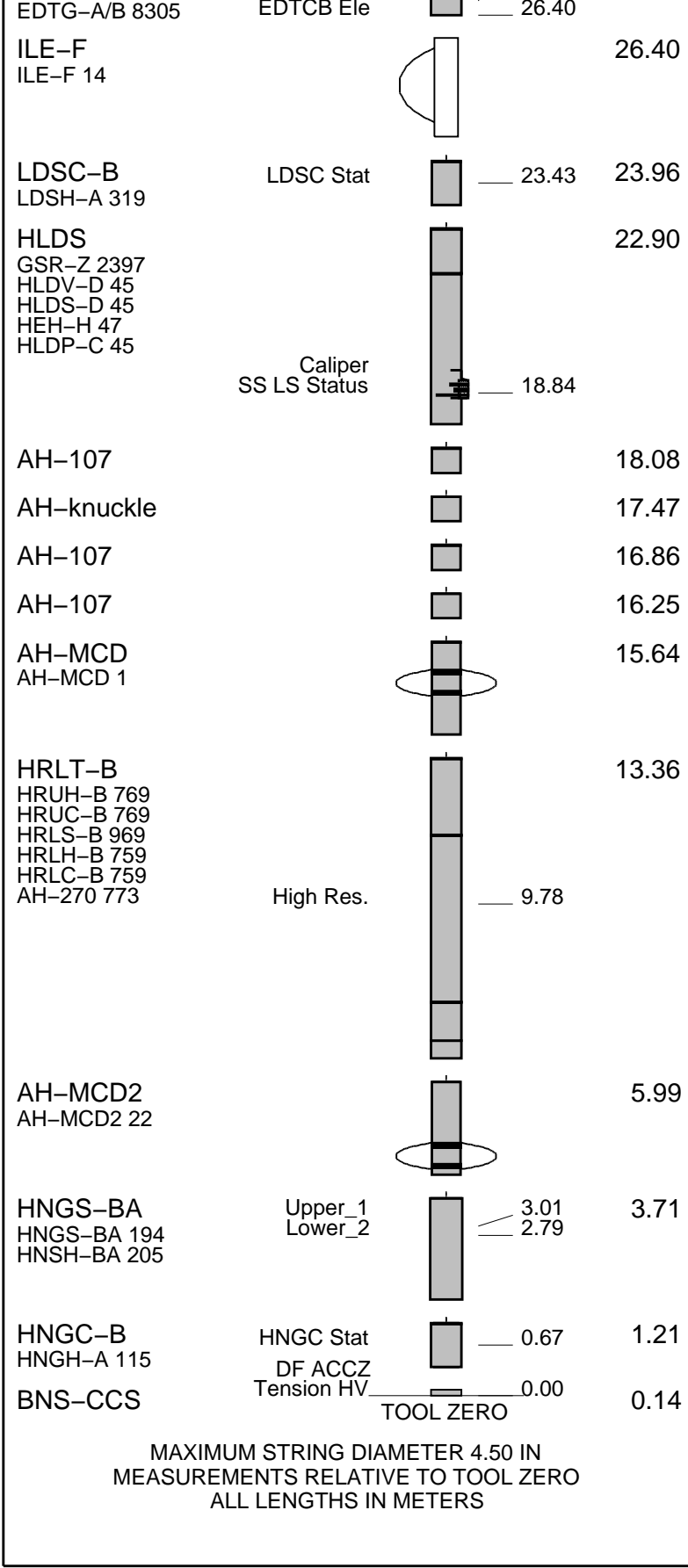
**SURFACE EQUIPMENT**

GSR-U 616008  
 WITM (EDTS)-A 1

**RUN 2**

**DOWNHOLE EQUIPMENT**

LEH-QT				29.71
LEH-QT 301				
AH-369	MDSB_EDTC		28.38	28.82
	Mud Tempe		27.32	
	CTEM		26.75	28.38
EDTC-B	Gamma Ray			
EDTH-B 8303	EFTB DIAG			
EDTC-B 8317	TelStatus			

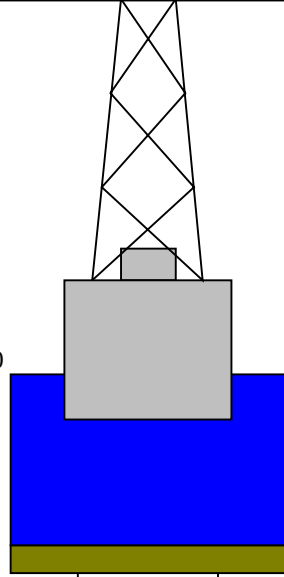


Production String	(in)	(M)	Well Schematic	(M)	(in)	Casing String
	OD	ID		MD	MD	

Kelly Bushing Elevation  
Derrick Floor Elevation

Mean Sea Level

-1085.0  
-1085.0  
-1074.0



4.1



0 3.80  
98.9 9.875  
671.5

Sea Floor  
Open Hole  
Total Depth

### Input DLIS Files

DEFAULT	NGS_HRLA_LDL_013LUP	FN:14	PRODUCER	15-Jan-2012 05:04	1753.4 M	1073.2 M
---------	---------------------	-------	----------	-------------------	----------	----------

### Output DLIS Files

DEFAULT	NGS_HRLA_LDL_017PUP	FN:20	PRODUCER	15-Jan-2012 07:47	667.5 M	-12.8 M
BACKUPDLIS	NGS_HRLA_LDL_017PUP	FN:21	PRODUCER	15-Jan-2012 07:48	667.5 M	-12.8 M

### OP System Version: 19C0-187

HNGC-B	19C0-187	HNGS-BA	19C0-187
HRLT-B	19C0-187	HLDS	19C0-187
LDSC-B	19C0-187	EDTC-B	SKK-5169-EDTCB

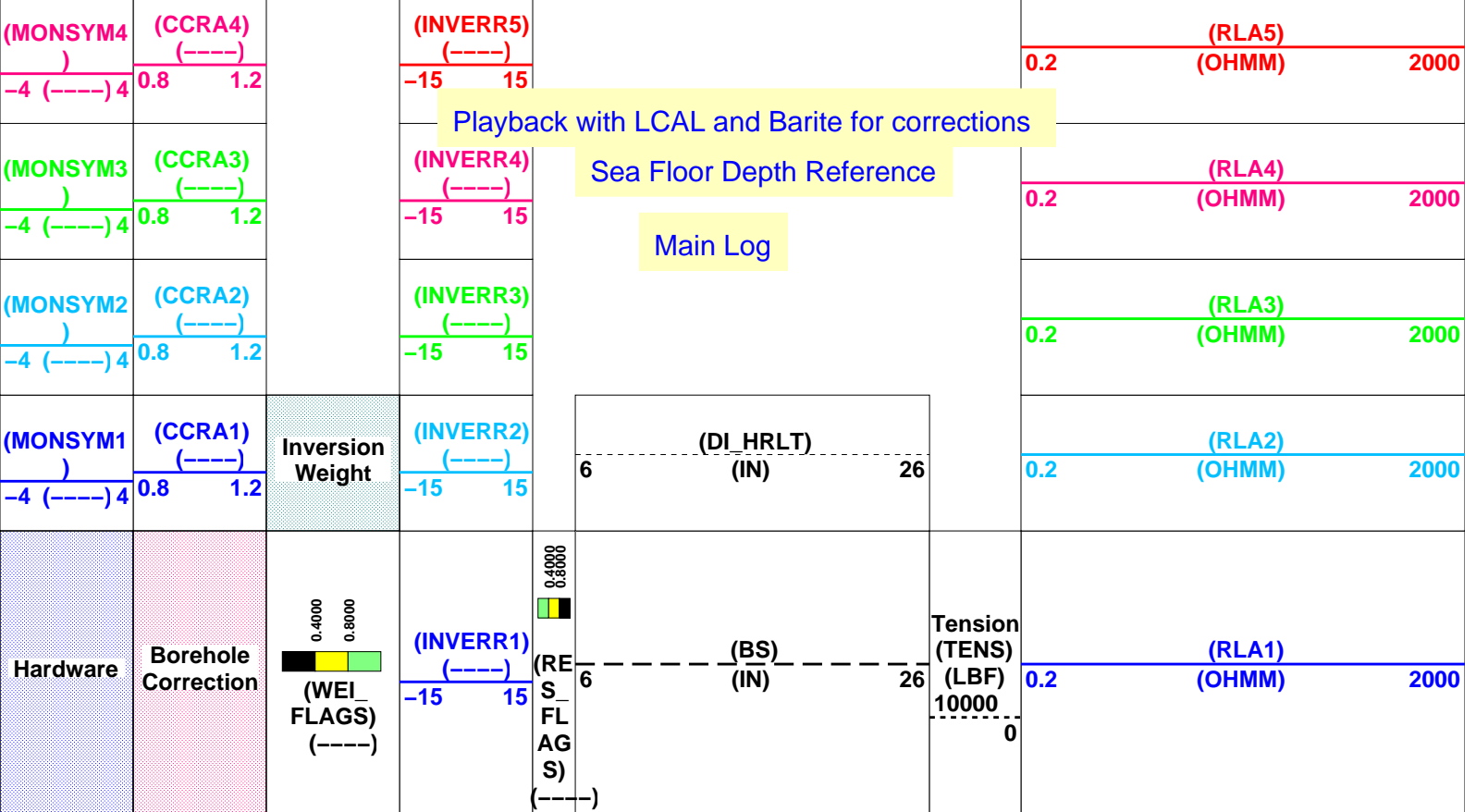
### PIP SUMMARY

Time Mark Every 60 S

		<b>(RT_HRLT)</b>	
		<b>0.2</b>	<b>2000</b>
		<b>(OHMM)</b>	
		<b>(RM_HRLT)</b>	
		<b>0.02</b>	<b>200</b>
		<b>(OHMM)</b>	
		<b>(RXO_HRLT)</b>	
		<b>0.2</b>	<b>2000</b>
		<b>(OHMM)</b>	

<b>(MONSYM5)</b>	<b>(CCRA5)</b>
<b>)</b>	<b>(-----)</b>
<b>-4 (-----) 4</b>	<b>0.8 1.2</b>

Inversion



\*\*\* HRLT FLAG TRACKS \*\*\*

BLACK areas show that the corresponding error flag is set.

TRACK R3\_LQC

INVERSION WEIGHT

Contribution from each hrlt channel in Inversion algorithm, and from left to right :

| Wei1 | Wei2 | Wei3 | Wei4 | Wei5 |

GREEN = OK

YELLOW = Contribution QUESTIONABLE

BLACK = Contribution UNRELIABLE

TRACK R5\_LQC

RESISTIVITY QUALITY INDICATOR

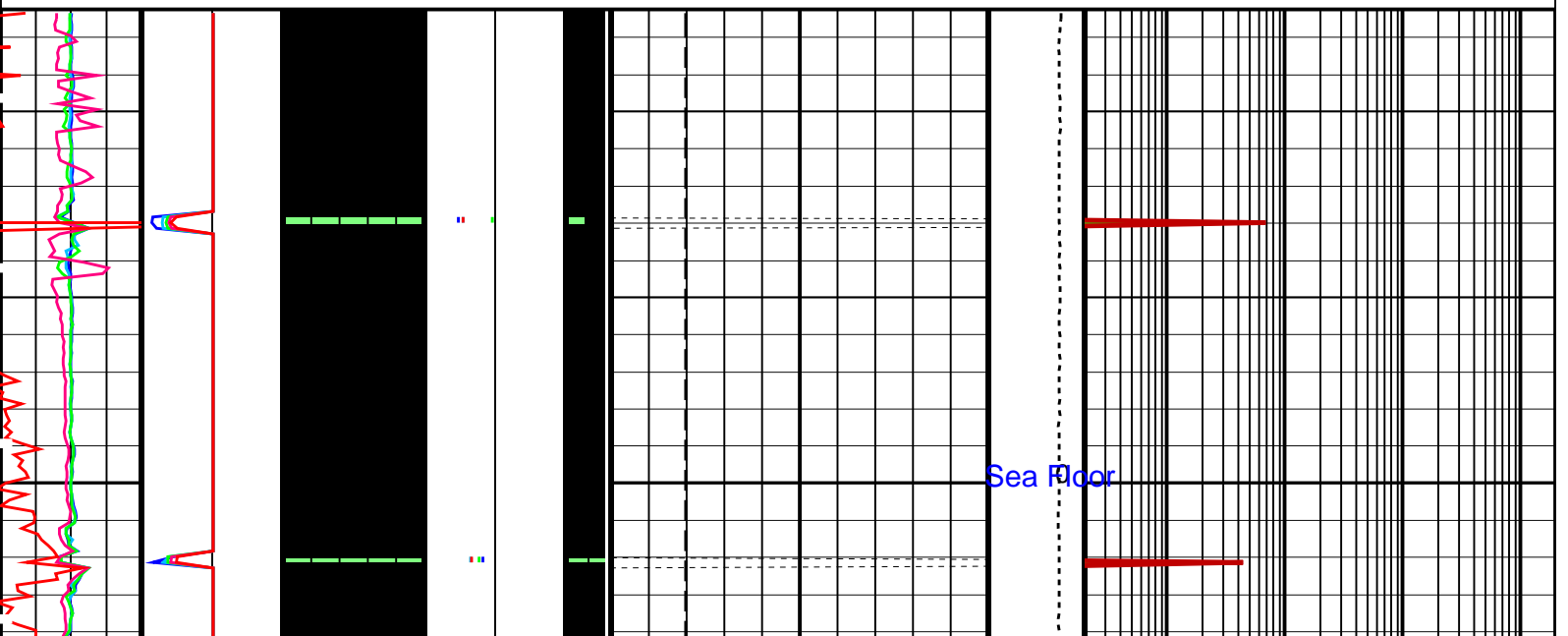
LQC flags on RXO\_HRLT & RT\_HRLT, and from left to right :

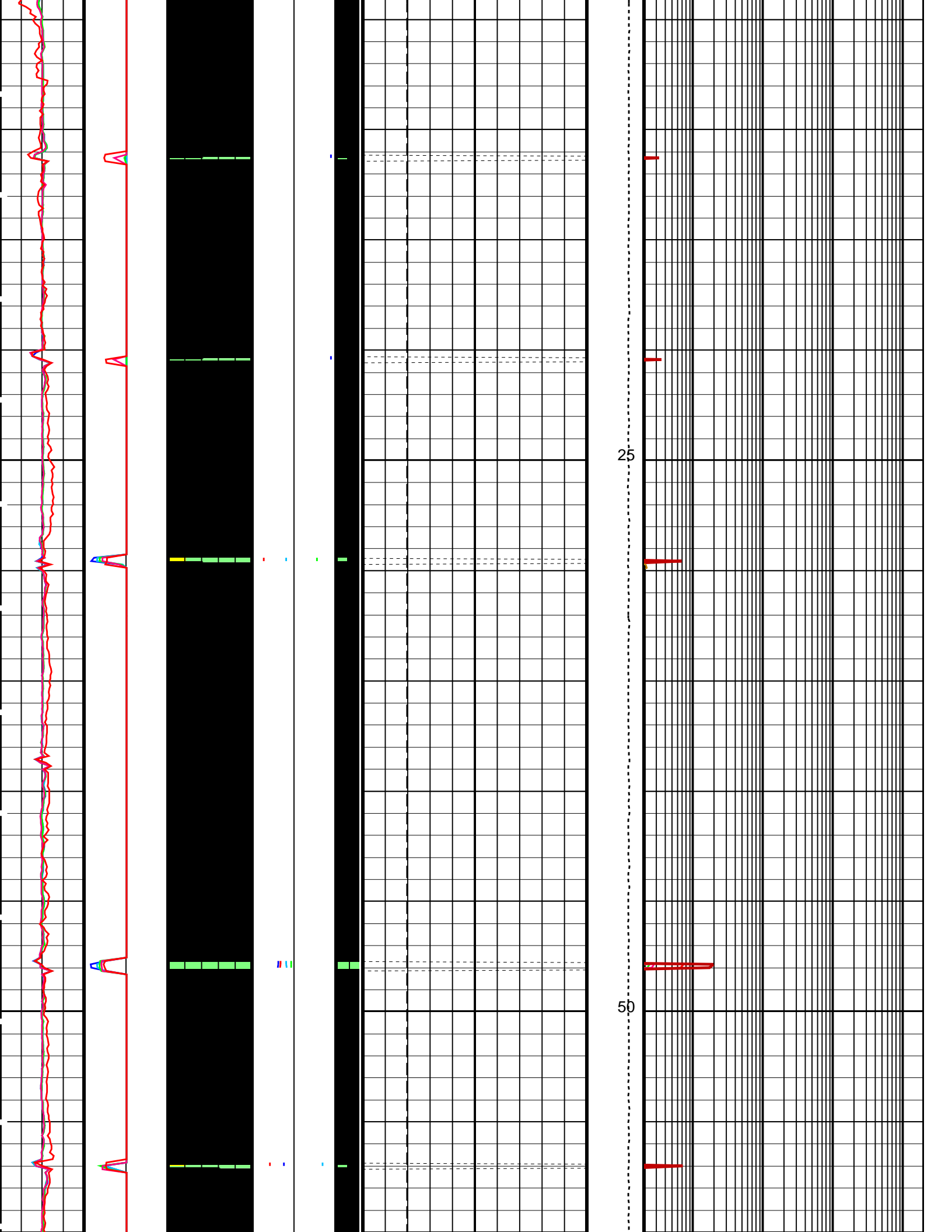
| RxoFlag | RTFlag |

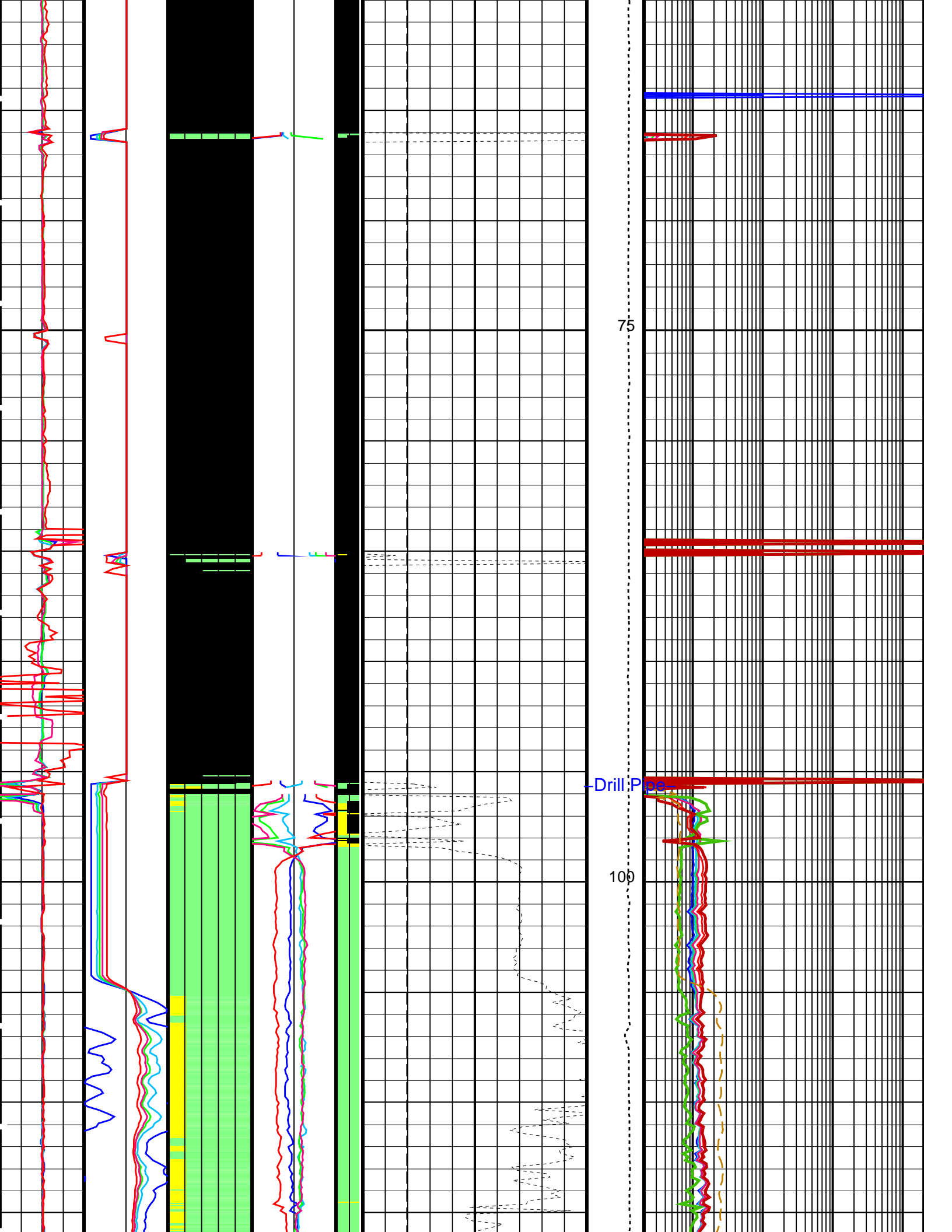
GREEN = OK

YELLOW = SHOULDER BED EFFECT

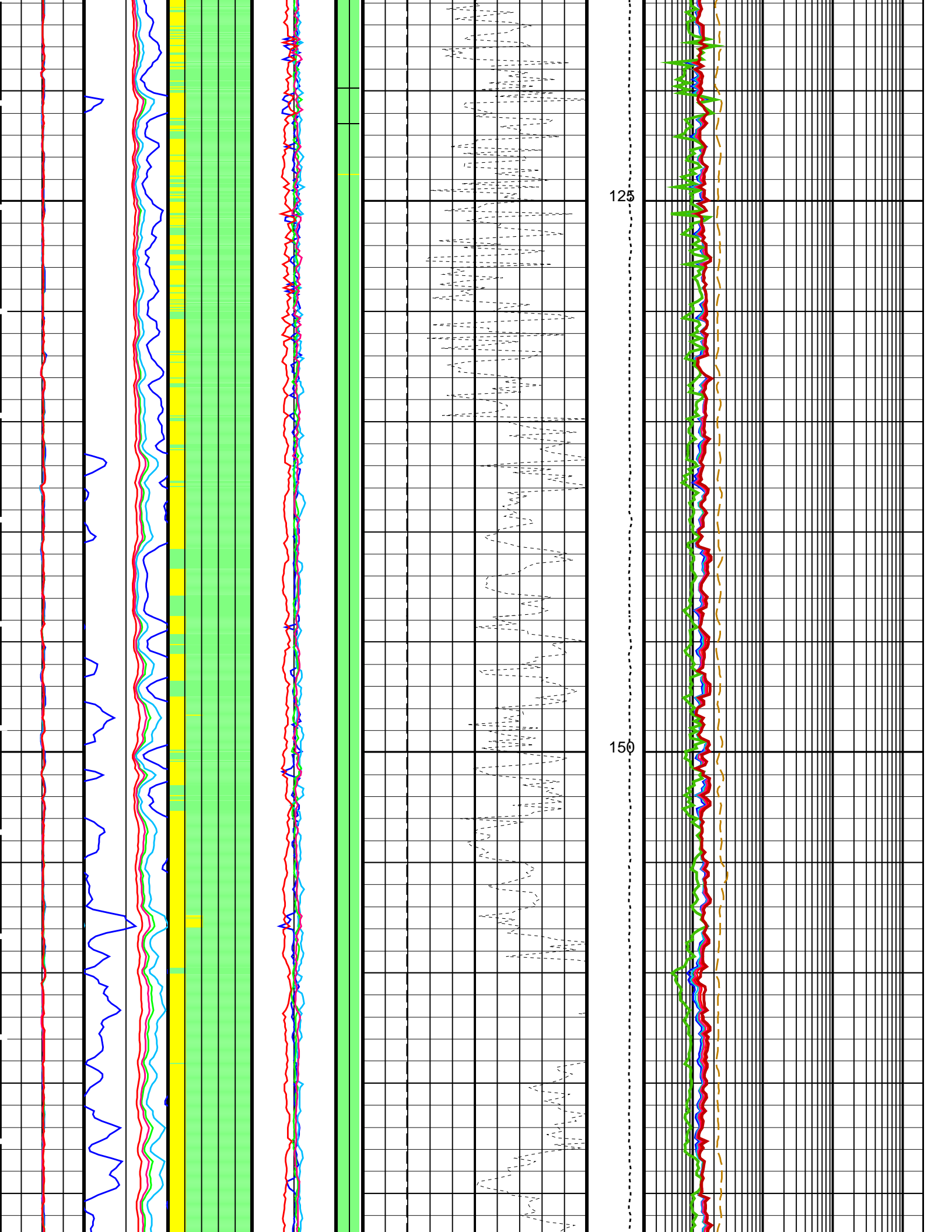
BLACK = NOK

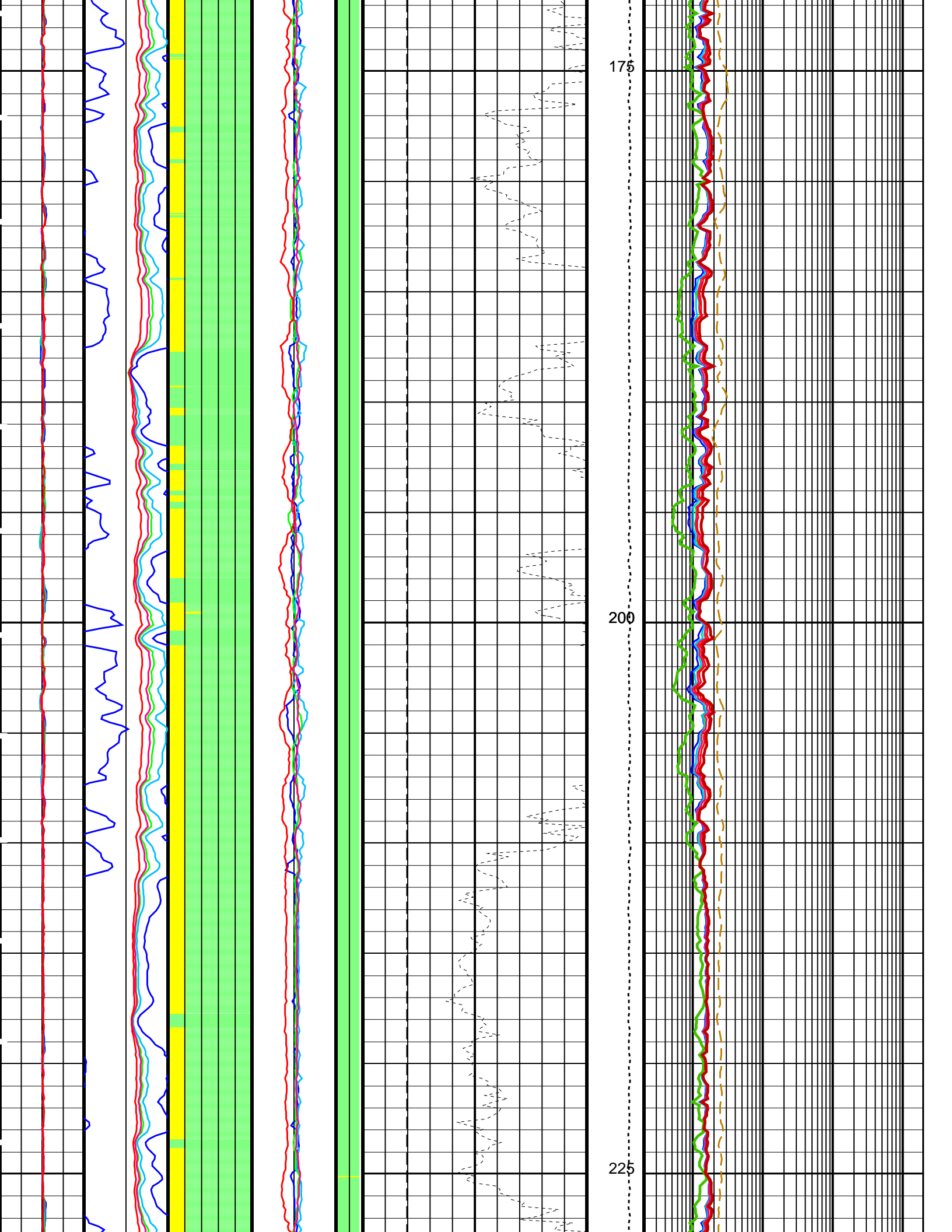


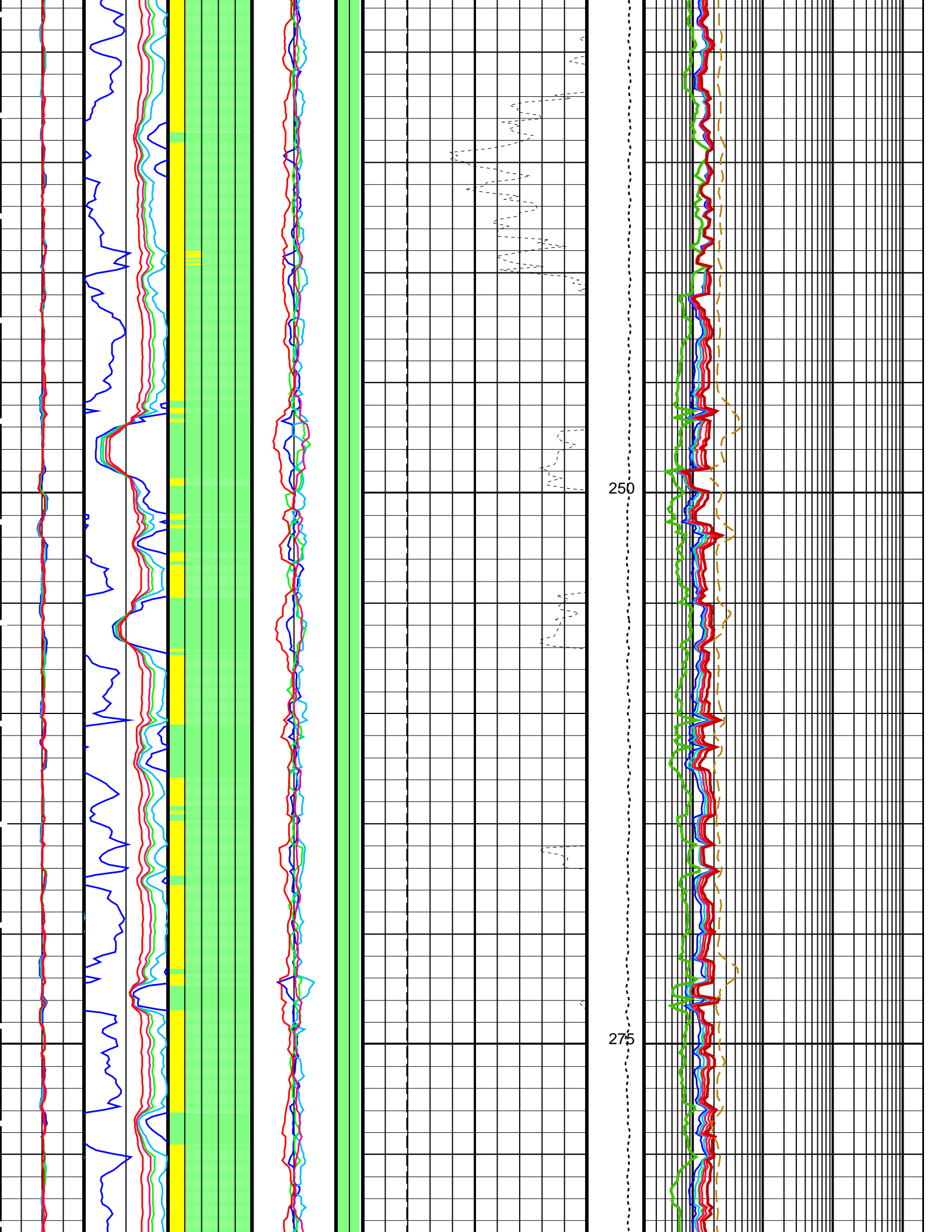


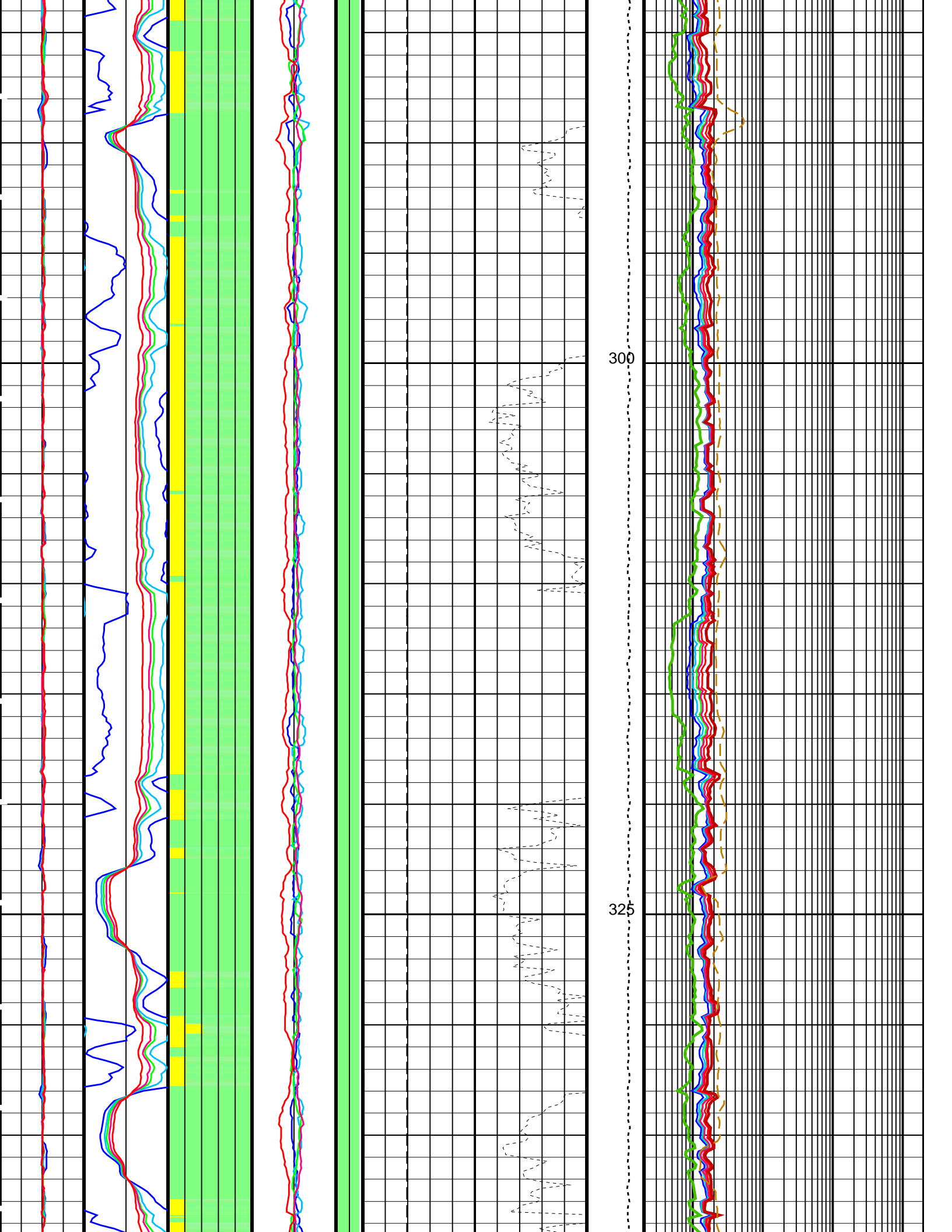


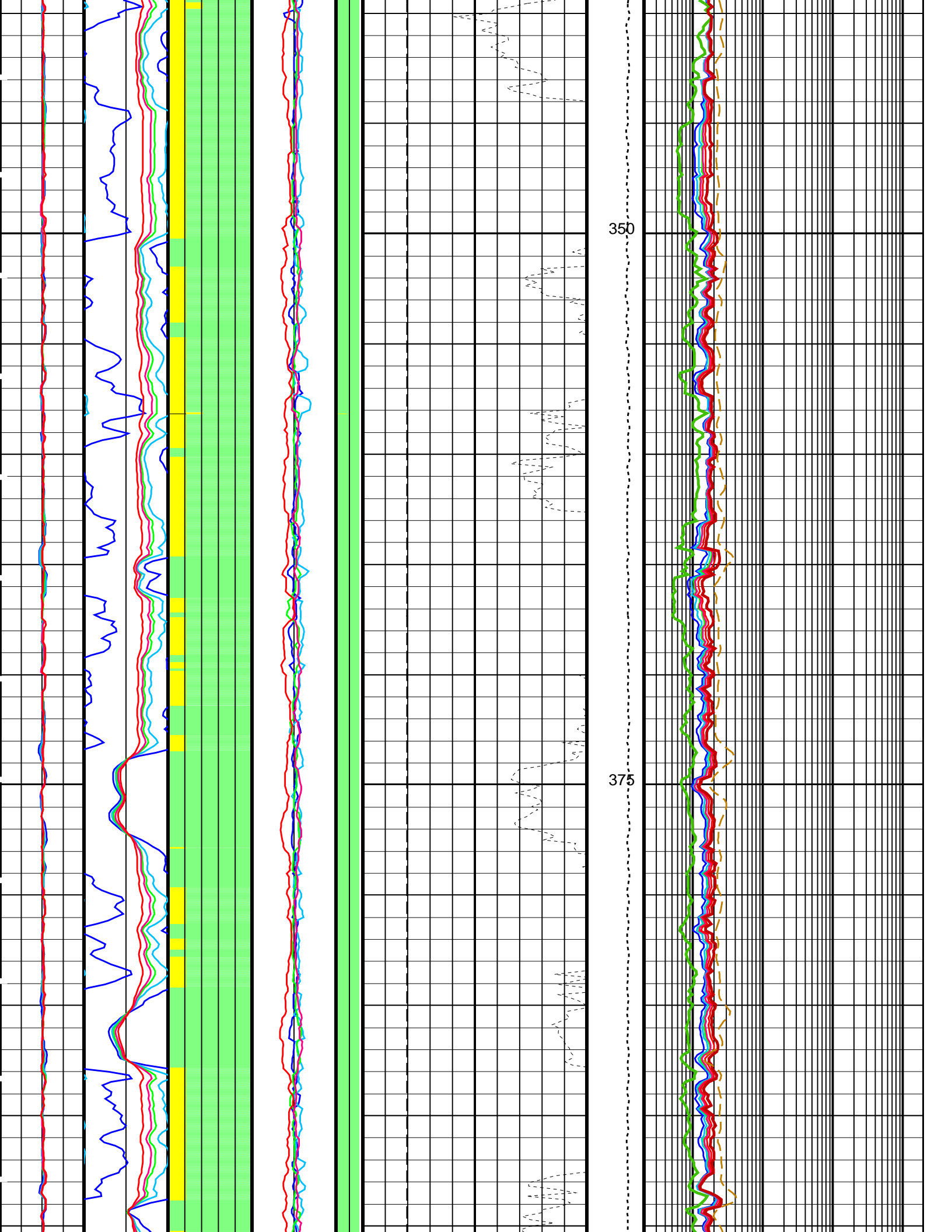


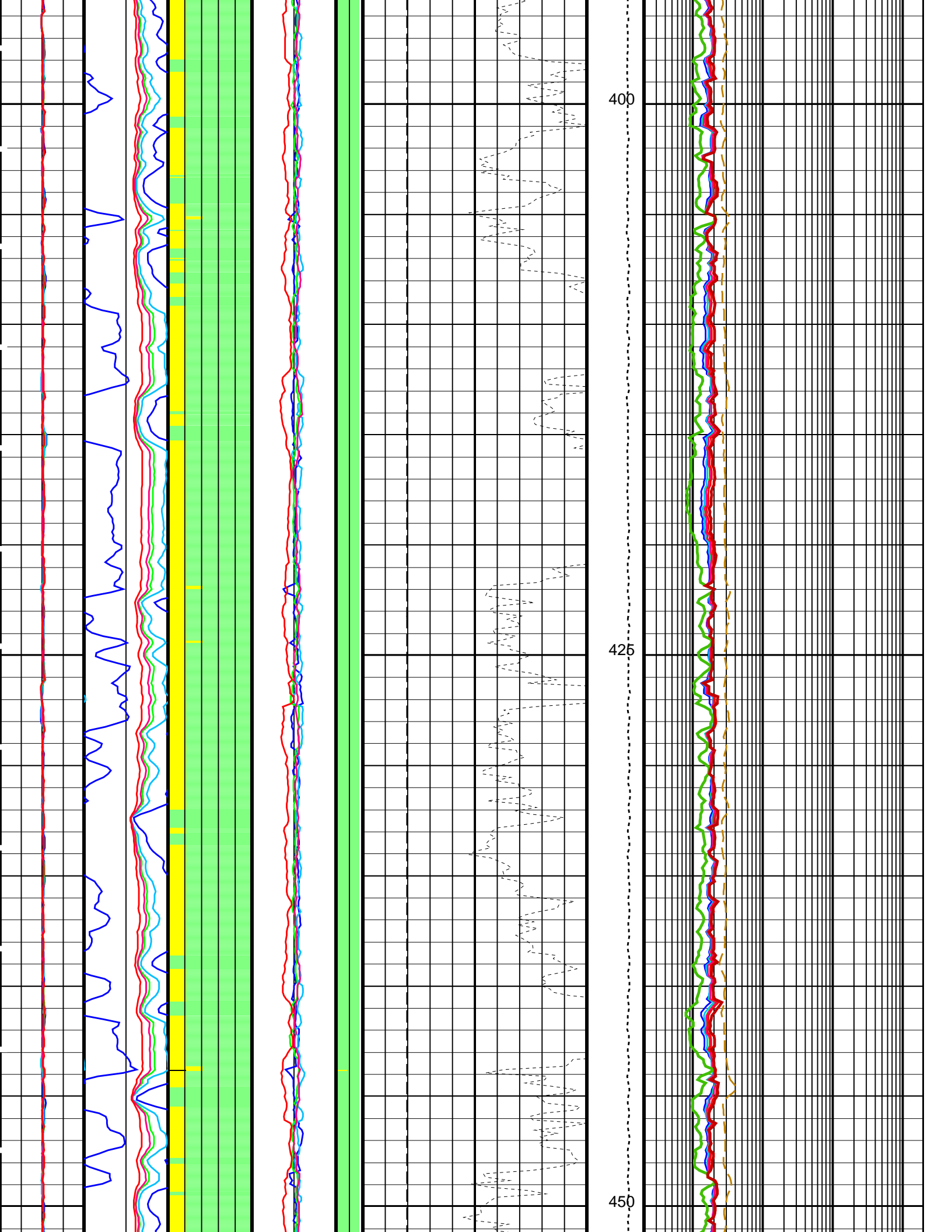


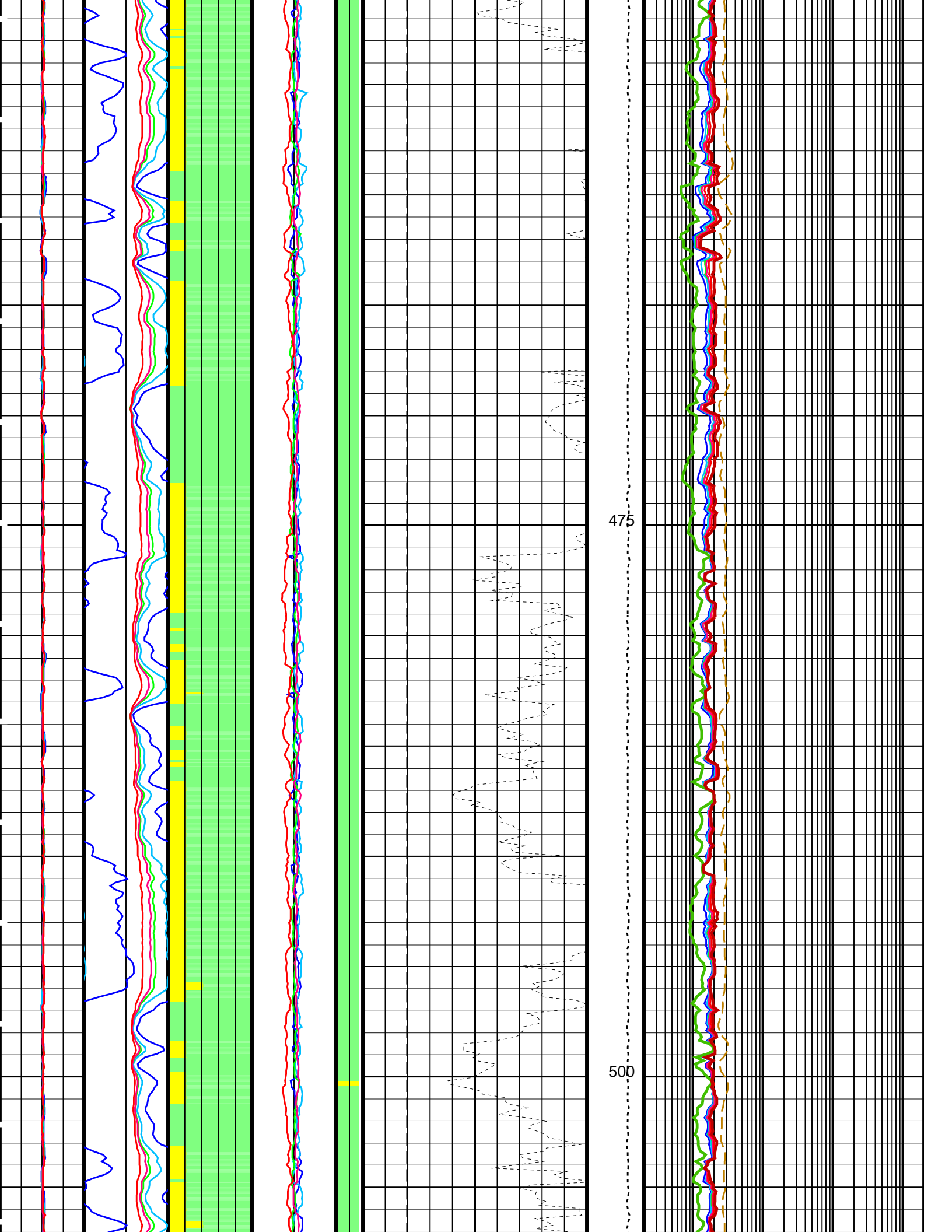


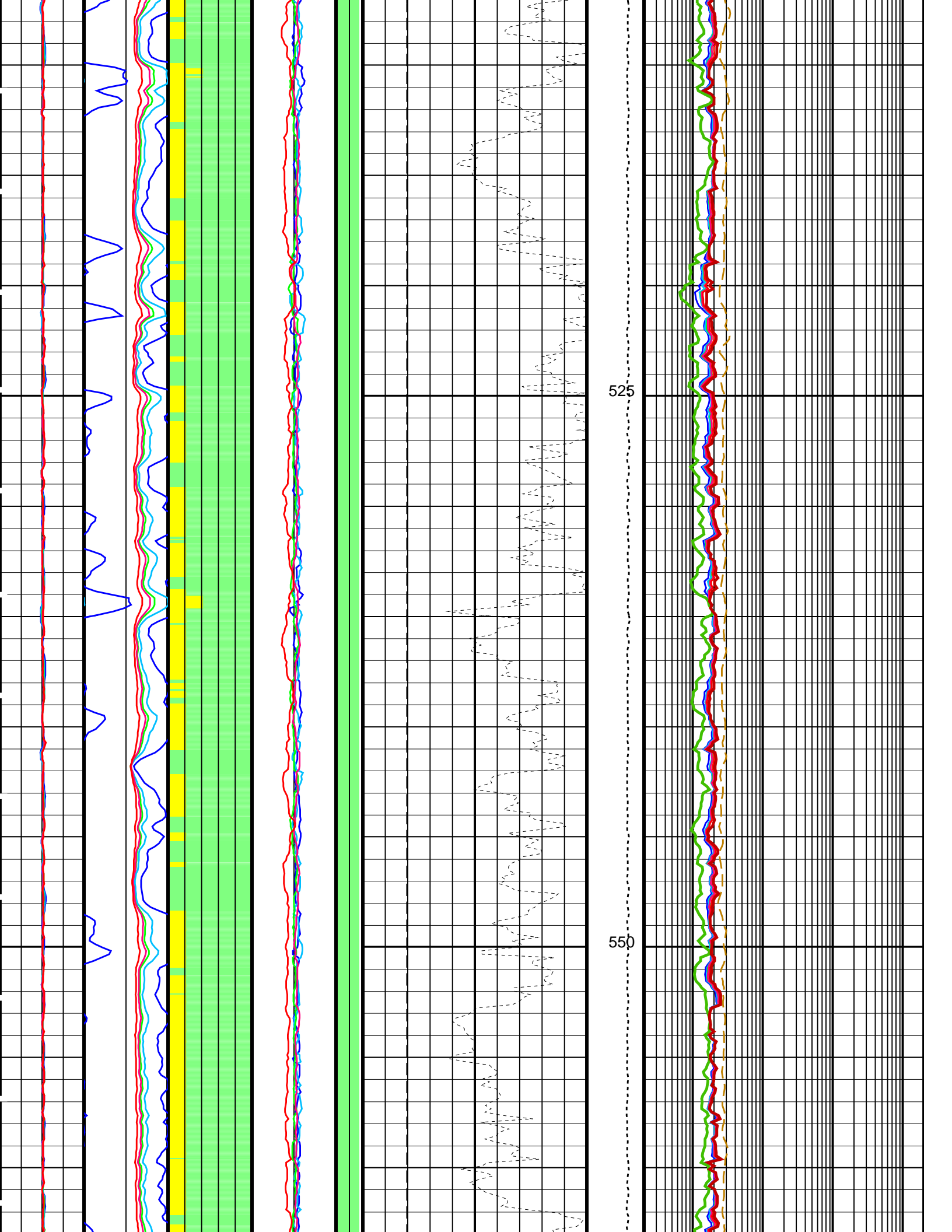




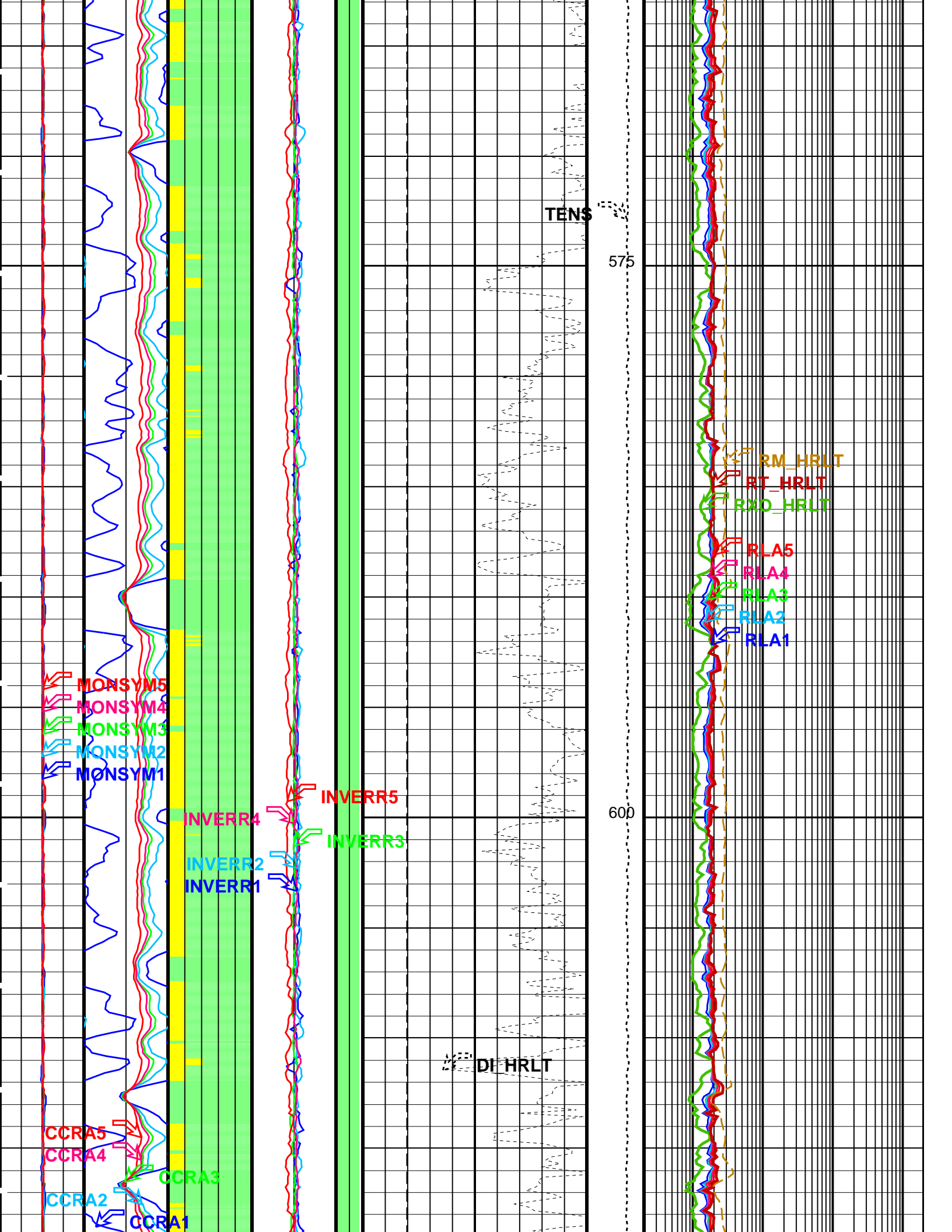


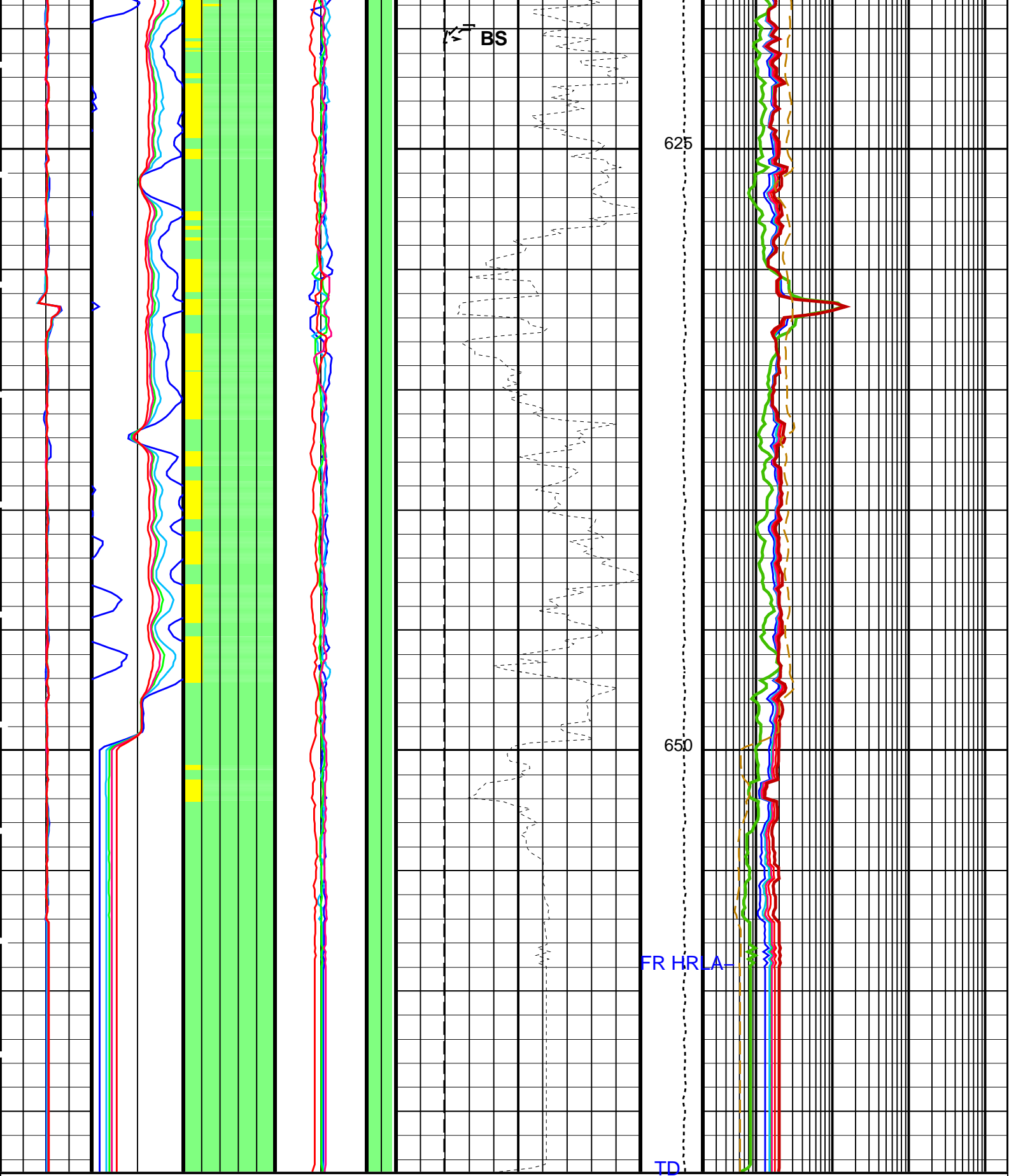












\*\*\* HRLT FLAG TRACKS \*\*\*

BLACK areas show that the corresponding error flag is set.

TRACK R3\_LQC

INVERSION WEIGHT

Contribution from each hrlt channel in Inversion algorithm, and from left to right :

| Wei1 | Wei2 | Wei3 | Wei4 | Wei5 |

GREEN = OK

YELLOW = Contribution QUESTIONABLE

BLACK = Contribution UNRELIABLE

TRACK R5\_LQC

RESISTIVITY QUALITY INDICATOR


LQC flags on RXO\_HRLT & RT\_HRLT, and from left to right :

| RxoFlag | RTFlag |

GREEN = OK

YELLOW = SHOULDER BED EFFECT

BLACK = NOK

Hardware	Borehole Correction	 (WEI_FLAGS) (----)	(INVERR1) (----) -15 15	(BS) (IN) 6 26	Tension (TENS) (LBF) 0.2 2000	(RLA1) (OHMM) 2000
(MONSYM1) (----)	(CCRA1) (----)	Inversion Weight	(INVERR2) (----)	(DI_HRLT) (IN)	0.2	(RLA2) (OHMM) 2000
-4 (----) 4	0.8 1.2		-15 15	6 26	0.2	(RLA3) (OHMM) 2000
(MONSYM2) (----)	(CCRA2) (----)		(INVERR3) (----)	Main Log	0.2	(RLA4) (OHMM) 2000
-4 (----) 4	0.8 1.2		-15 15	Sea Floor Depth Reference	0.2	(RLA5) (OHMM) 2000
(MONSYM3) (----)	(CCRA3) (----)		(INVERR4) (----)		0.2	(RLA5) (OHMM) 2000
-4 (----) 4	0.8 1.2		-15 15	Playback with LCAL and Barite for corrections	0.2	(RXO_HRLT) (OHMM) 2000
(MONSYM4) (----)	(CCRA4) (----)		(INVERR5) (----)		0.02	(RM_HRLT) (OHMM) 200
-4 (----) 4	0.8 1.2		-15 15		0.2	(RT_HRLT) (OHMM) 2000
(MONSYM5) (----)	(CCRA5) (----)	Inversion			0.2	(RT_HRLT) (OHMM) 2000
-4 (----) 4	0.8 1.2				0.2	(RT_HRLT) (OHMM) 2000

PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
HNGS-BA: Hostile Natural Gamma Ray Sonde		
BAR1	HNGS Detector 1 Barite Constant	1
BAR2	HNGS Detector 2 Barite Constant	1
BHK	HNGS Borehole Potassium Correction Concentration	0
BHS	Borehole Status	OPEN
BHT	Bottom Hole Temperature (used in calculations)	50 DEG F
CSD1	Inner Casing Outer Diameter	0 IN
CSD2	Outer Casing Outer Diameter	0 IN
CSW1	Inner Casing Weight	0 LB/F
CSW2	Outer Casing Weight	0 LB/F
DBCC	HNGS Barite Constant Correction Flag	NONE
GCSE	Generalized Caliper Selection	LCAL
GDEV	Average Angular Deviation of Borehole from Normal	0 DEG
GGRD	Geothermal Gradient	0.01 DF/F

GRSE	Generalized Mud Resistivity Selection	CHART_GEN 9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
H1P	HNGS Detector 1 Allow/Disallow In Processing	ALLOW	
H2P	HNGS Detector 2 Allow/Disallow In Processing	ALLOW	
HABK	HNGS Borehole Potassium Running Average	-0.00416761	
HALF	HNGS Alpha Filter Length	60	IN
HCRB	HNGS Apply Borehole Potassium Correction	NONE	
HMWM	Mud Weighting Material	BARI	
HNPE	HNGS Processing Enable	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
S1BI	HNGS Detector 1 Calibration Bismuth Count Rate	1.3	CPS
S2BI	HNGS Detector 2 Calibration Bismuth Count Rate	1.3	CPS
SGRC	HNGS Standard Gamma-Ray Correction Flag	YES	
SHT	Surface Hole Temperature	68	DEGF
TPOS	Tool Position	CENT	
VBA1	HNGS Detector 1 Variable Barite Factor Running Average	0.974112	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	0.970002	

HRLT-B: High Resolution Laterolog Array - B

BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	50	DEGF
CALSTAT	HRLTB Calibration Status	SHALLOW_DONE	
CALTEMP	HRLTB Calibration Temperature	20.4572	DEGC
FREQ0	HRLT Frequency Index for Mode 0	32	
FREQ1	HRLT Frequency Index for Mode 1	128	
FREQ2	HRLT Frequency Index for Mode 2	104	
FREQ3	HRLT Frequency Index for Mode 3	86	
FREQ4	HRLT Frequency Index for Mode 4	56	
FREQ5	HRLT Frequency Index for Mode 5	44	
FREQ6	HRLT Frequency Index for Mode 6	116	
GCSE	Generalized Caliper Selection	LCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN 9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
ISSBAR	Barite Mud Switch	NOBARITE	
KFAC_HRLT	HRLT K Factor Option	SONDE	
LOOPCOEF_S	HRLT Loop Coefficient for Shallow Modes	LOW	
LOOPMOD0	HRLT Mode 0 Loop Mode	OFF	
LOOPMOD1	HRLT Mode 1 Loop Mode	OFF	
LOOPMOD2	HRLT Mode 2 Loop Mode	OFF	
LOOPMOD3	HRLT Mode 3 Loop Mode	OFF	
LOOPMOD4	HRLT Mode 4 Loop Mode	OFF	
LOOPMOD5	HRLT Mode 5 Loop Mode	OFF	
LOOPMOD6	HRLT Mode 6 Loop Mode	OFF	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
PROCINV	Inversion Selection	ON	
PROCMFL	Inversion Micro-Resistivity Selection	NO_EXTERNAL_RXO	
PROCMO	Mechanical Standoff Fin Size	0	IN
PROCRM	Processing Mud Resistivity Select	HRLT_Compute	
PROCSPO	Sonde Position	Centered	
SHT	Surface Hole Temperature	68	DEGF

HLDS: Hostile Litho-Density Sonde

CLCL	HLDS LS Control Loop Controller Mode	AUTO_DEFAULT	
CLCS	HLDS SS Control Loop Controller Mode	AUTO_DEFAULT	
CLLS	HLDS Mode Loop Long Spacing	AUTO	
CLSS	HLDS Mode Loop Short Spacing	AUTO	
DHC	Density Hole Correction	BS	
DPPM	Density Porosity Processing Mode	HIRS	
FD	Fluid Density	1	G/C3
LATC	HLDS Activation Correction	OFF	
LLDL	HLDS LS Low Level Discriminator DAC	14000	
LLDS	HLDS SS Low Level Discriminator DAC	14000	
LLML	HLDS LS Low Level Discriminator Mode	AUTO	
LLMS	HLDS SS Low Level Discriminator Mode	AUTO	
MDEN	Matrix Density	2.71	G/C3
PHVL	HLDS Long Spacing High Voltage Setting	1000	V
PHVS	HLDS Short Spacing High Voltage Setting	1000	V
PSDL	HLDS LS Pulse Shape Compensation DAC	30000	
PSDS	HLDS SS Pulse Shape Compensation DAC	30000	
PSML	HLDS LS Pulse Shape Compensation Mode	AUTO	
PSMS	HLDS SS Pulse Shape Compensation Mode	AUTO	

EDTC-B: Enhanced DTS Cartridge

BHFL	Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	50	DEGF
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DPPM	Density Porosity Processing Mode	HIRS	
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	LCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN 9	

GRSE	Generalized Mud Resistivity Selection	CHART_GEN_3	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCO	Hole Size Correction Option	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
ISSBAR_EDTC	Nuclear Mud Type	BARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MWCO	Mud Weight Correction Option	YES	
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0	IN
SOCO	Standoff Correction Option	NO	
TPOS_EDTC	EDTC Tool Centered/Eccentered	Eccentered	
U-ETELM_EDTS	Telemetry Mode for eWAFE	Standard_EDTS	
U-TELM_EDTS	Telemetry Mode for WAFE	Standard_EDTS	
System and Miscellaneous			
ALTDPCCHAN	Name of alternate depth channel	SpeedCorrectedDepth	
BS	Bit Size	9.875	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	10.750	IN
CWEI	Casing Weight	43.00	LB/F
DFD	Drilling Fluid Density	1.25	G/C3
DO	Depth Offset for Playback	-1086.0	M
FLEV	Fluid Level	-50000.00	M
MST	Mud Sample Temperature	-50000.00	DEGC
PBVSADP	Use alternate depth channel for playback	NO	
PP	Playback Processing	RECOMPUTE	
RMFS	Resistivity of Mud Filtrate Sample	-50000.0000	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	1765	M
TDD	Total Depth - Driller	1765.00	M
TDL	Total Depth - Logger	1765.00	M
TWS	Temperature of Connate Water Sample	37.78	DEGC

Format: HRLT\_LQC    Vertical Scale: 1:200    Graphics File Created: 15-Jan-2012 07:48

### OP System Version: 19C0-187

HNGC-B	19C0-187	HNGS-BA	19C0-187
HRLT-B	19C0-187	HLDS	19C0-187
LDSC-B	19C0-187	EDTC-B	SKK-5169-EDTCB

#### Input DLIS Files

DEFAULT	NGS_HRLA_LDL_013LUP	FN:14	PRODUCER	15-Jan-2012 05:04	1753.4 M	1073.2 M
---------	---------------------	-------	----------	-------------------	----------	----------

#### Output DLIS Files

DEFAULT	NGS_HRLA_LDL_017PUP	FN:20	PRODUCER	15-Jan-2012 07:47		
BACKUPDLIS	NGS_HRLA_LDL_017PUP	FN:21	PRODUCER	15-Jan-2012 07:48		

#### Input DLIS Files

DEFAULT	NGS_HRLA_LDL_013LUP	FN:14	PRODUCER	15-Jan-2012 05:04	1753.4 M	1073.2 M
---------	---------------------	-------	----------	-------------------	----------	----------

#### Output DLIS Files

DEFAULT	NGS_HRLA_LDL_016PUP	FN:18	PRODUCER	15-Jan-2012 07:37	667.5 M	-12.8 M
BACKUPDLIS	NGS_HRLA_LDL_016PUP	FN:19	PRODUCER	15-Jan-2012 07:37	667.5 M	-12.8 M

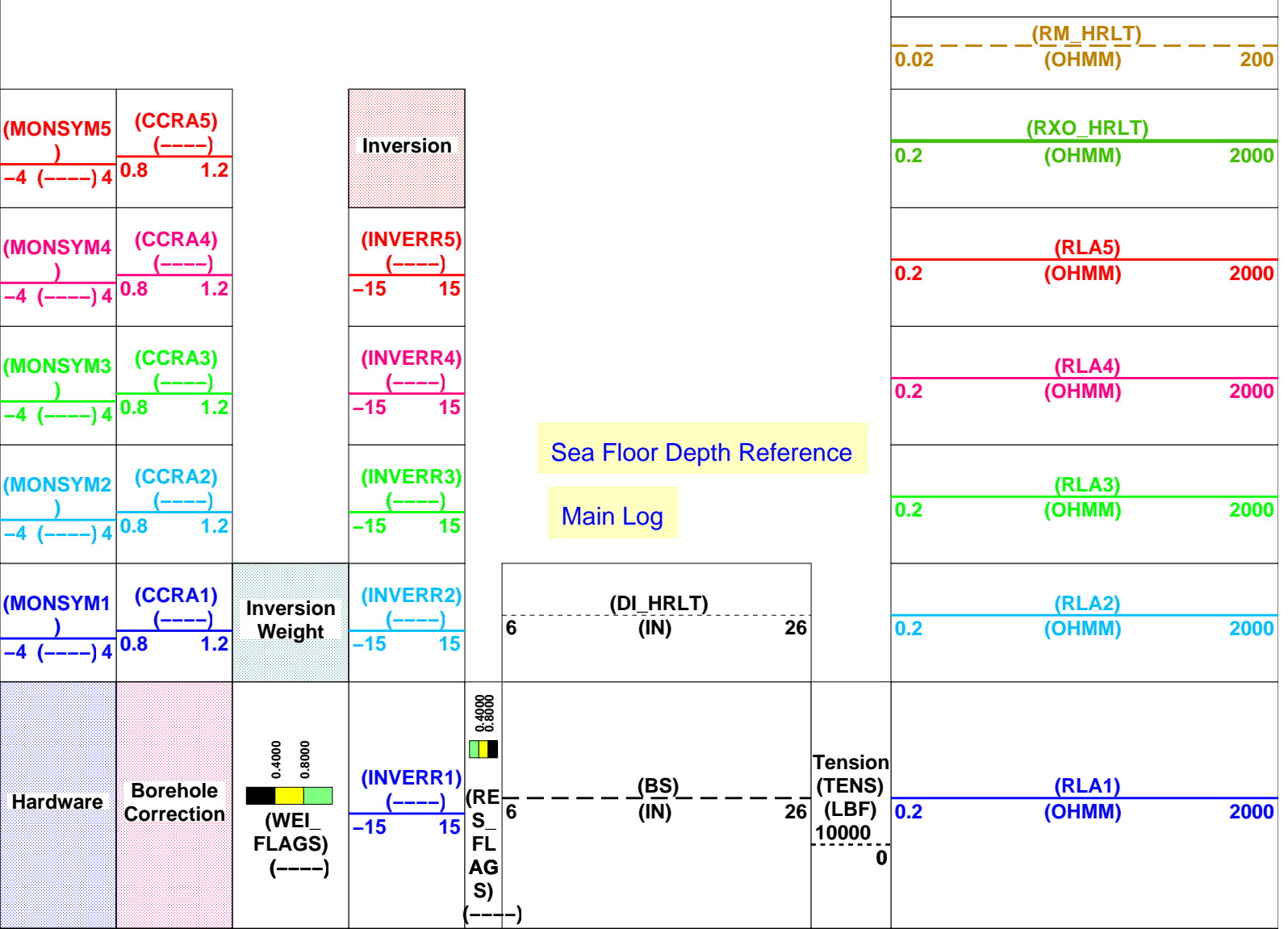
### OP System Version: 19C0-187

HNGC-B	19C0-187	HNGS-BA	19C0-187
HRLT-B	19C0-187	HLDS	19C0-187
LDSC-B	19C0-187	EDTC-B	SKK-5169-EDTCB

#### PIP SUMMARY

Time Mark Every 60 S

	(RT_HRLT)	
0.2	(OHMM)	2000



\*\*\* HRLT FLAG TRACKS \*\*\*

BLACK areas show that the corresponding error flag is set.

TRACK R3\_LQC

INVERSION WEIGHT

Contribution from each hrlt channel in Inversion algorithm, and from left to right :

| Wei1 | Wei2 | Wei3 | Wei4 | Wei5 |

GREEN = OK

YELLOW = Contribution QUESTIONABLE

BLACK = Contribution UNRELIABLE

TRACK R5\_LQC

RESISTIVITY QUALITY INDICATOR

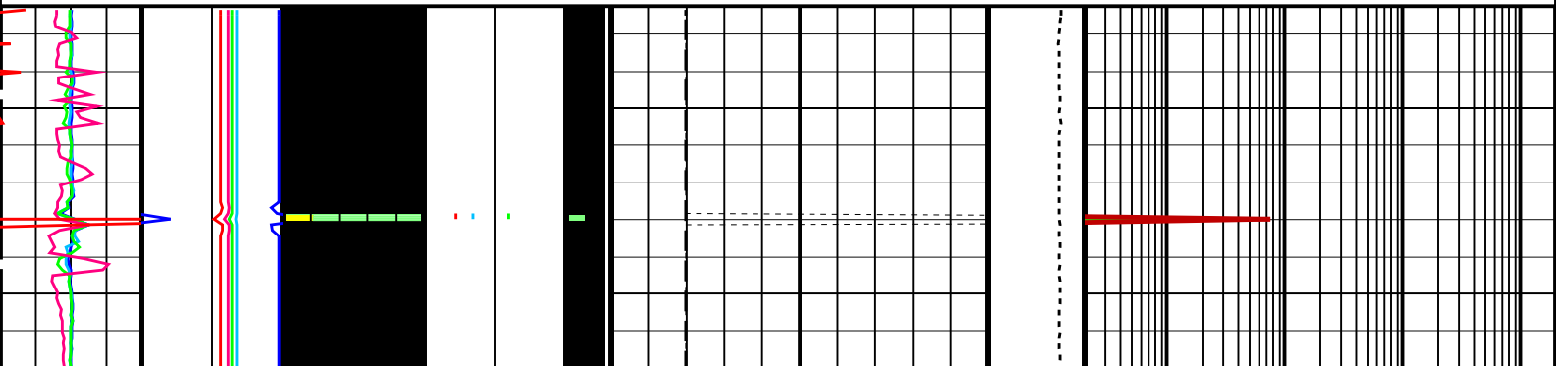
LQC flags on RXO\_HRLT & RT\_HRLT, and from left to right :

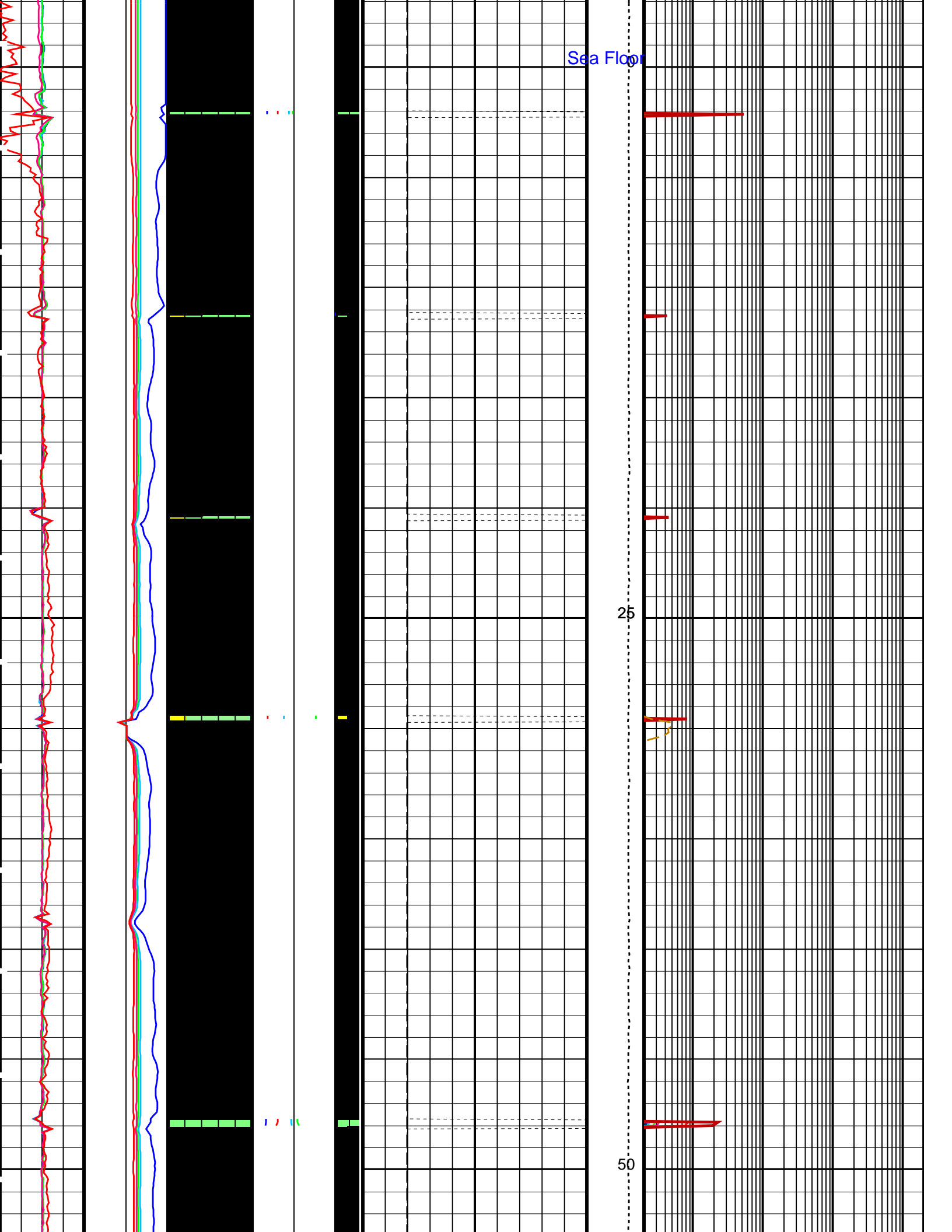
| RxoFlag | RTFlag |

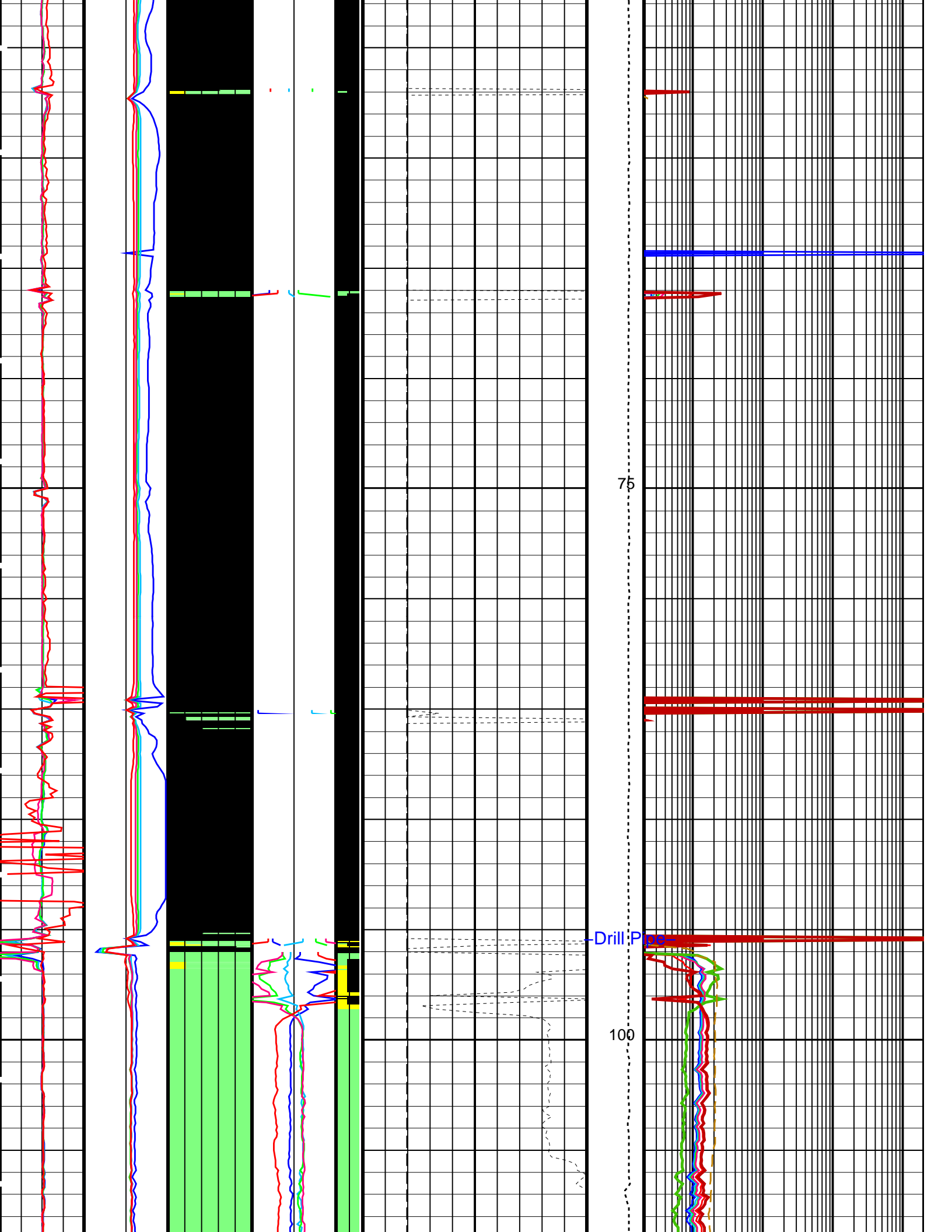
GREEN = OK

YELLOW = SHOULDER BED EFFECT

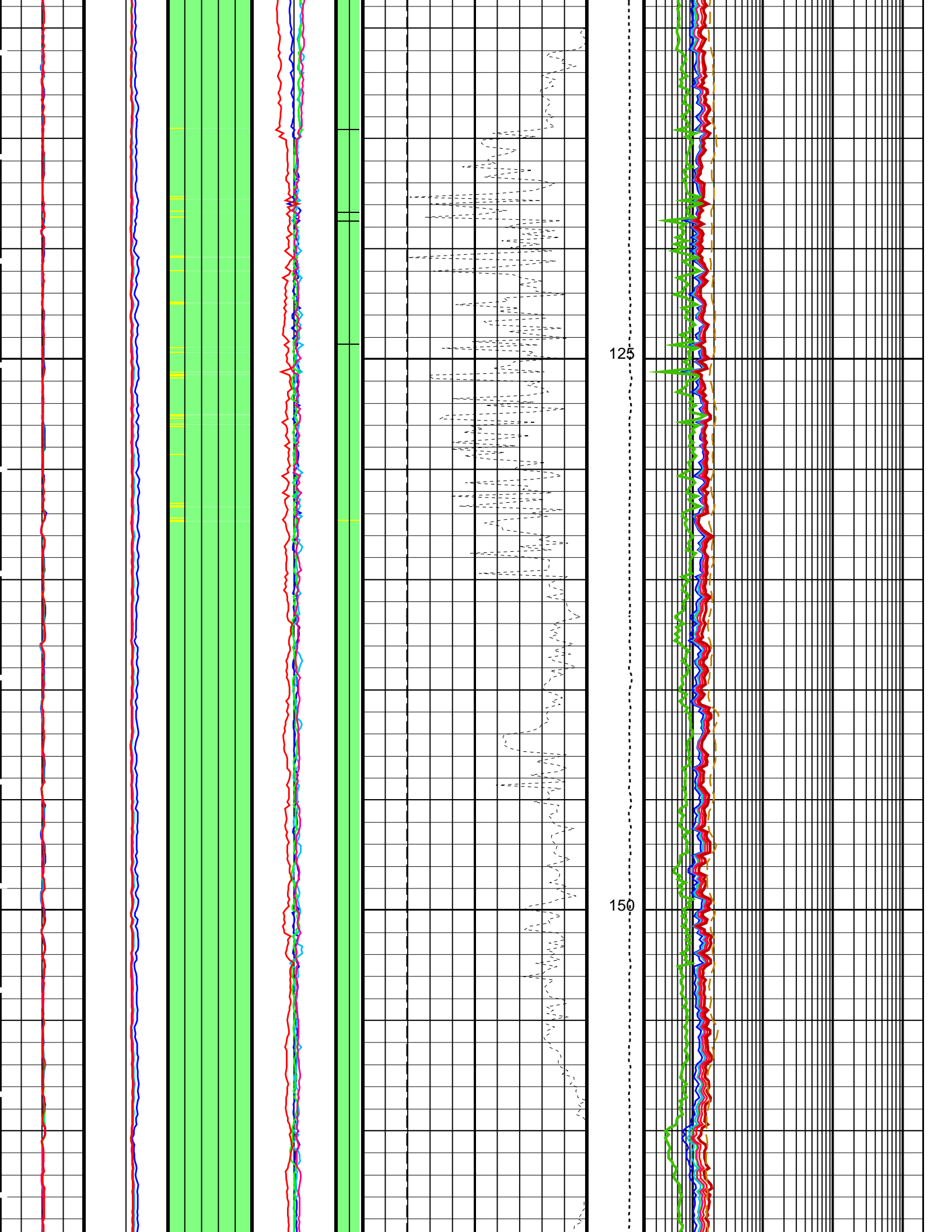
BLACK = NOK

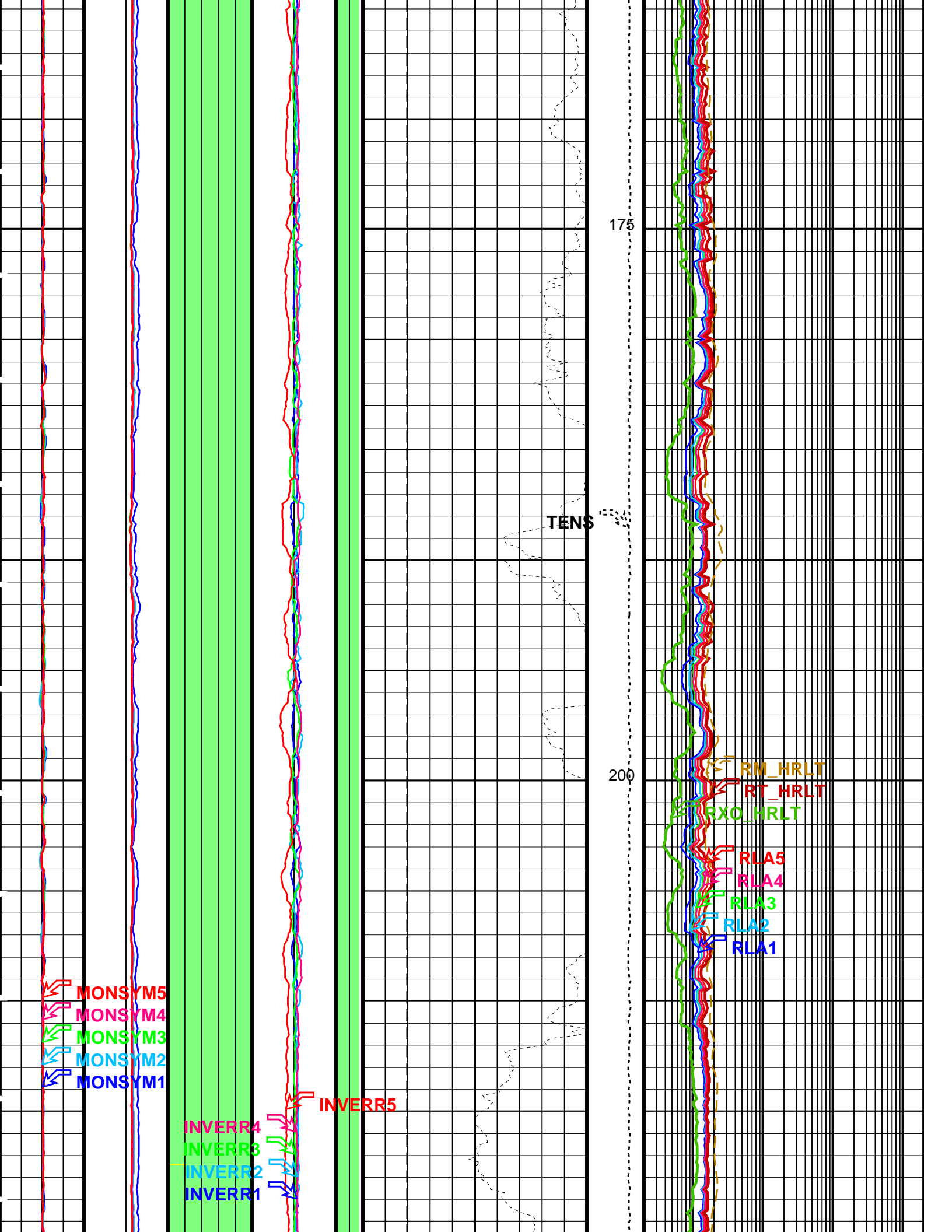




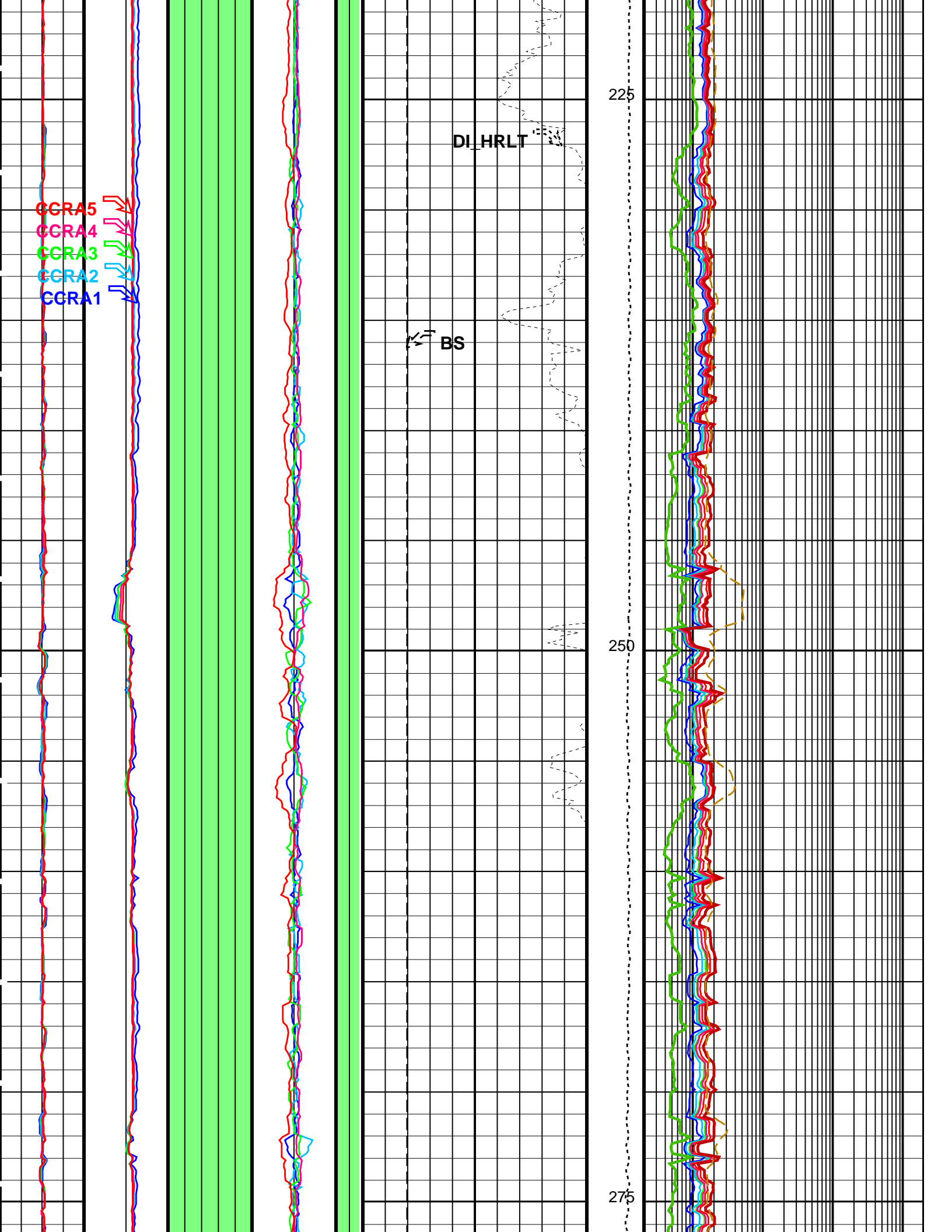




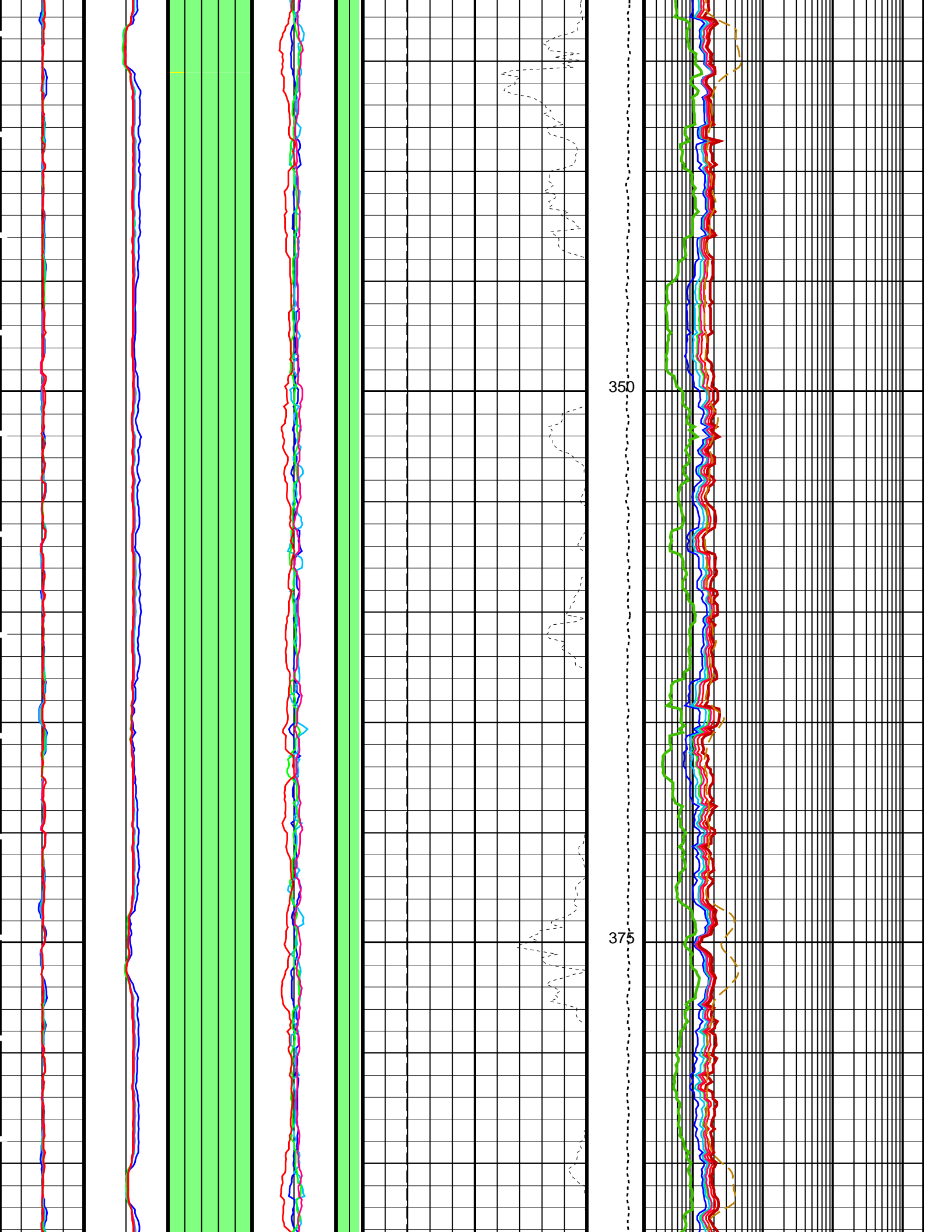


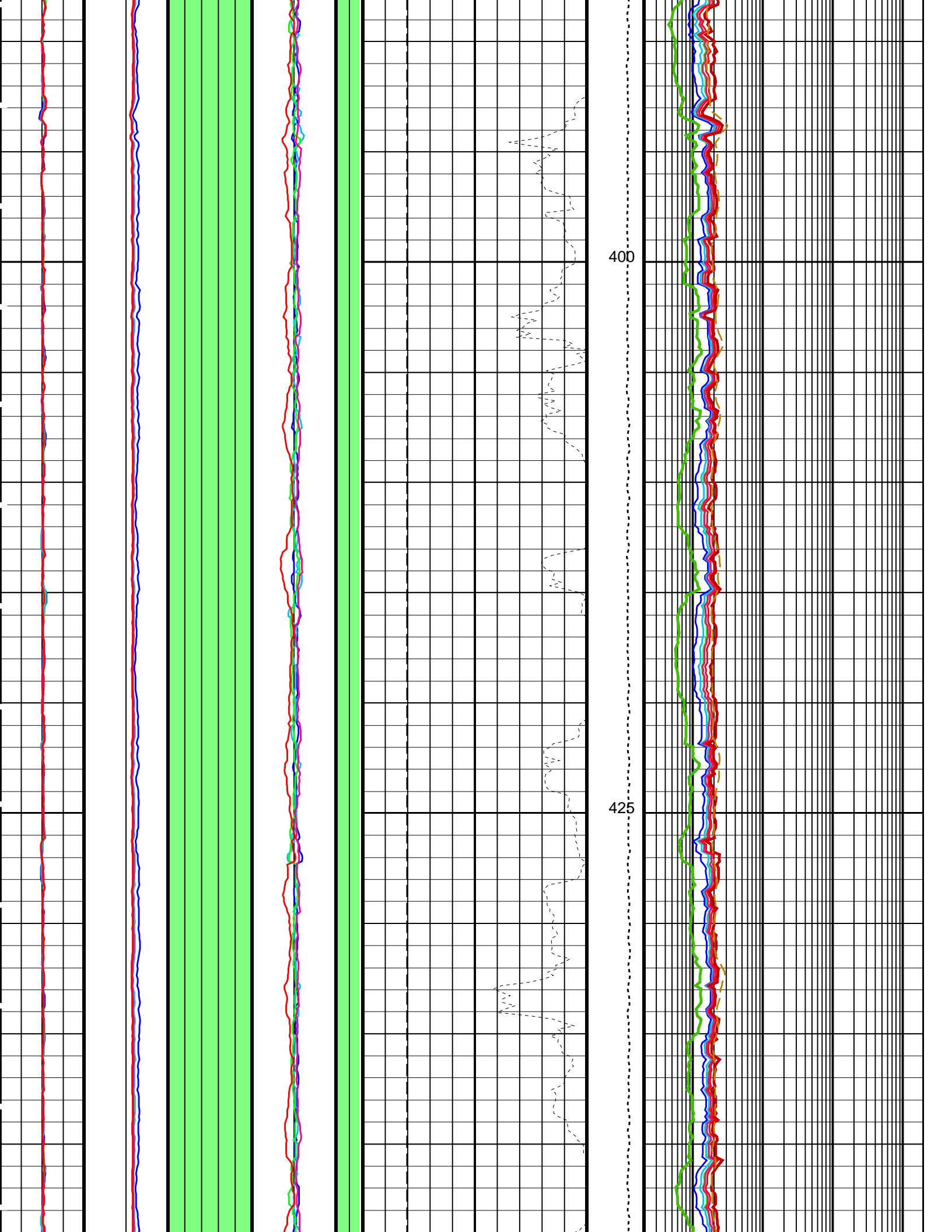


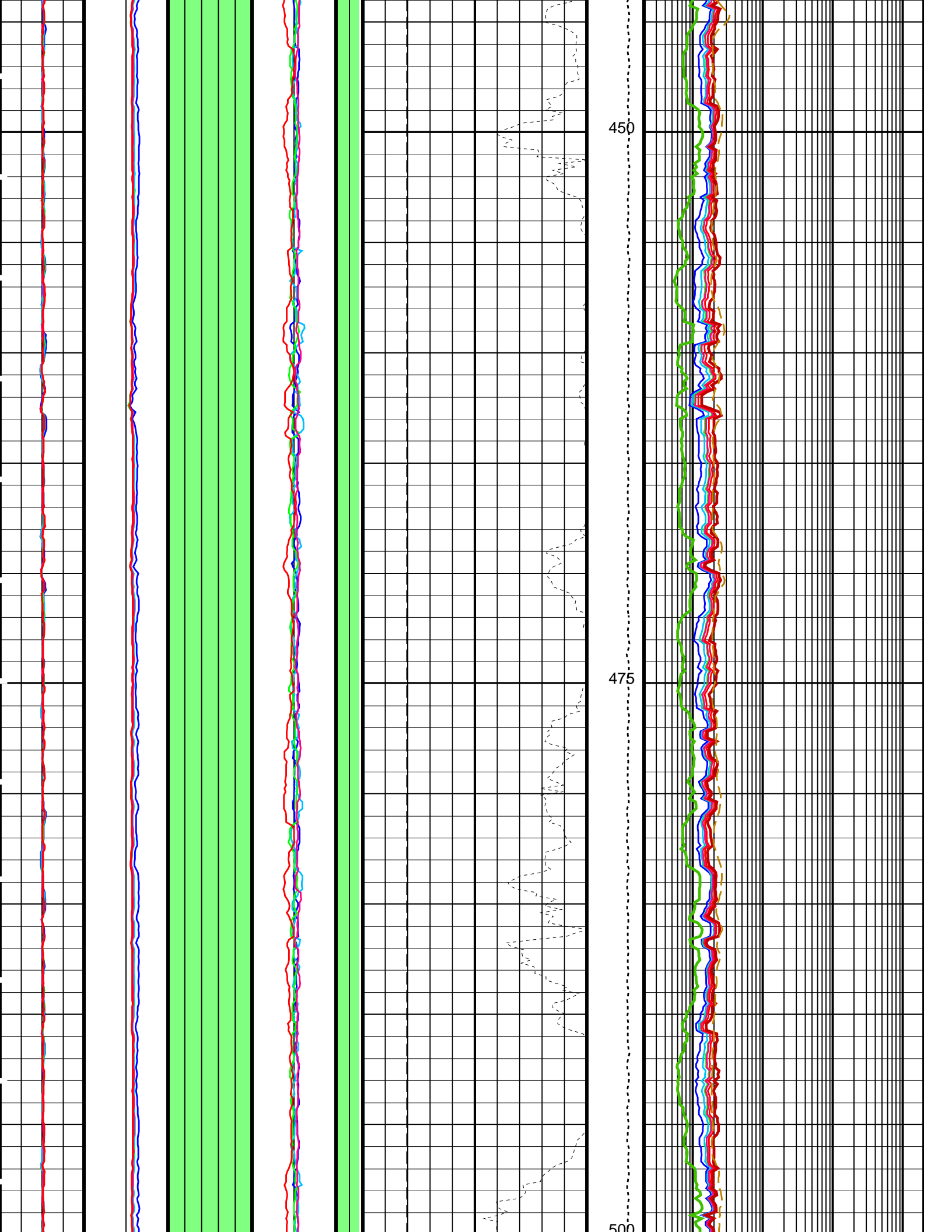
CGRA5  
CGRA4  
CGRA3  
CGRA2  
CGRA1

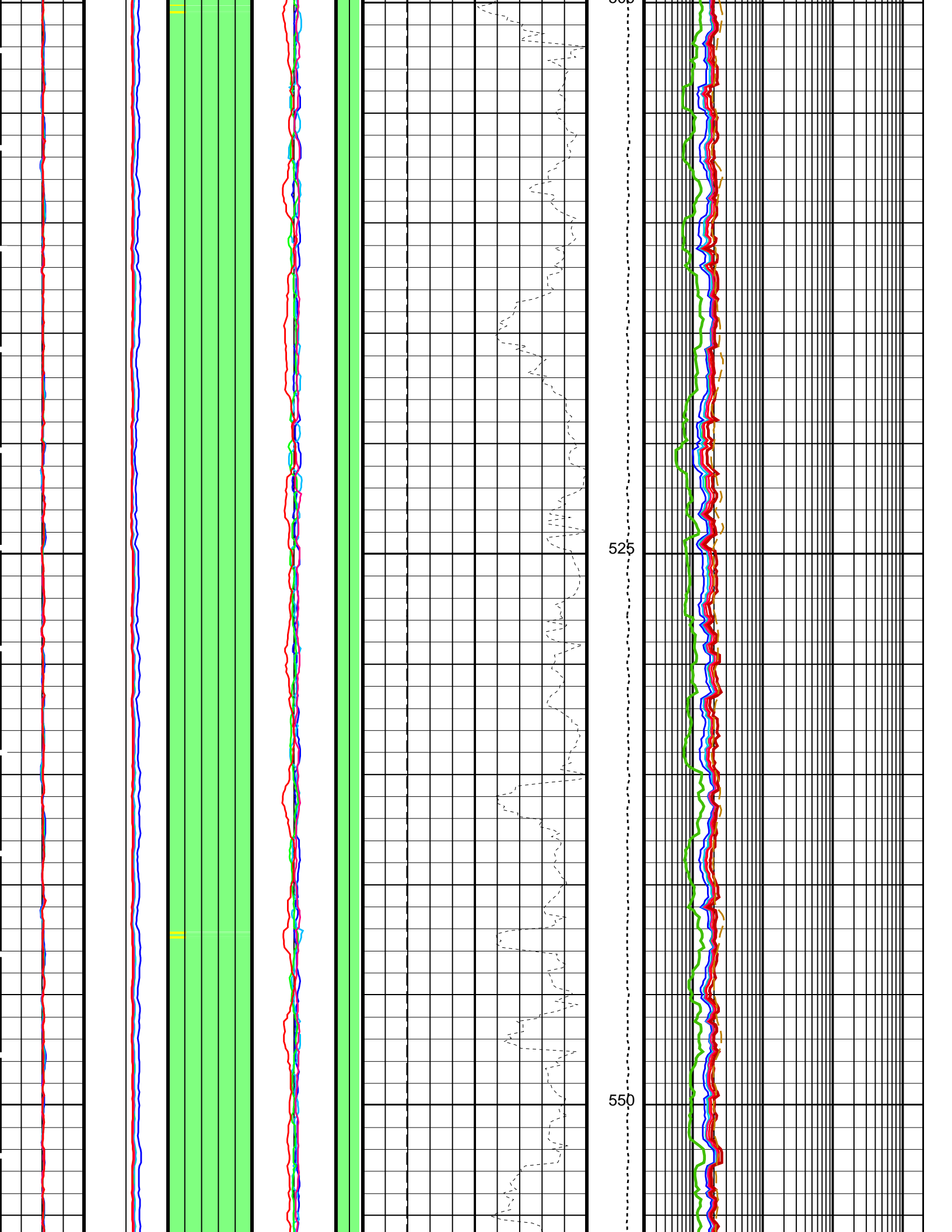




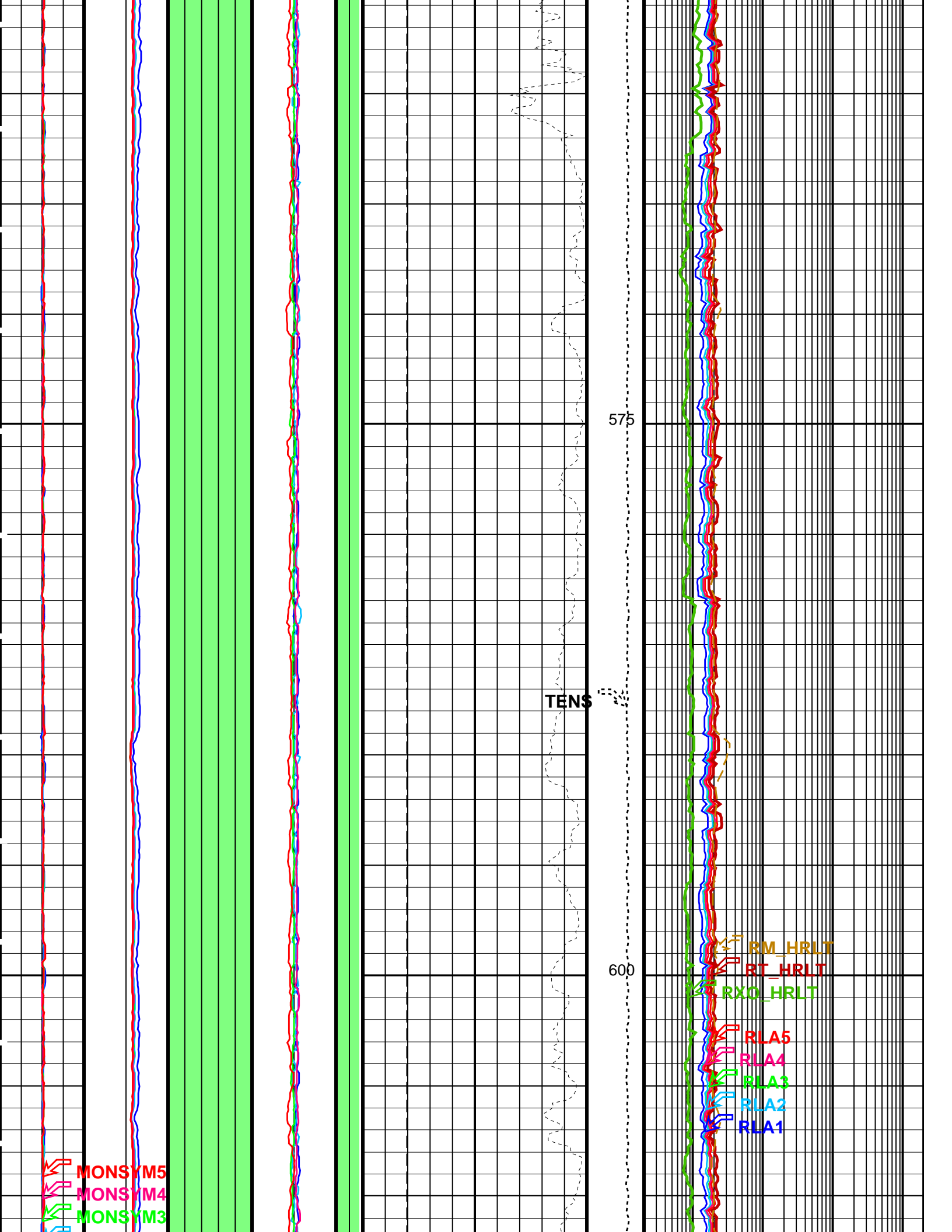












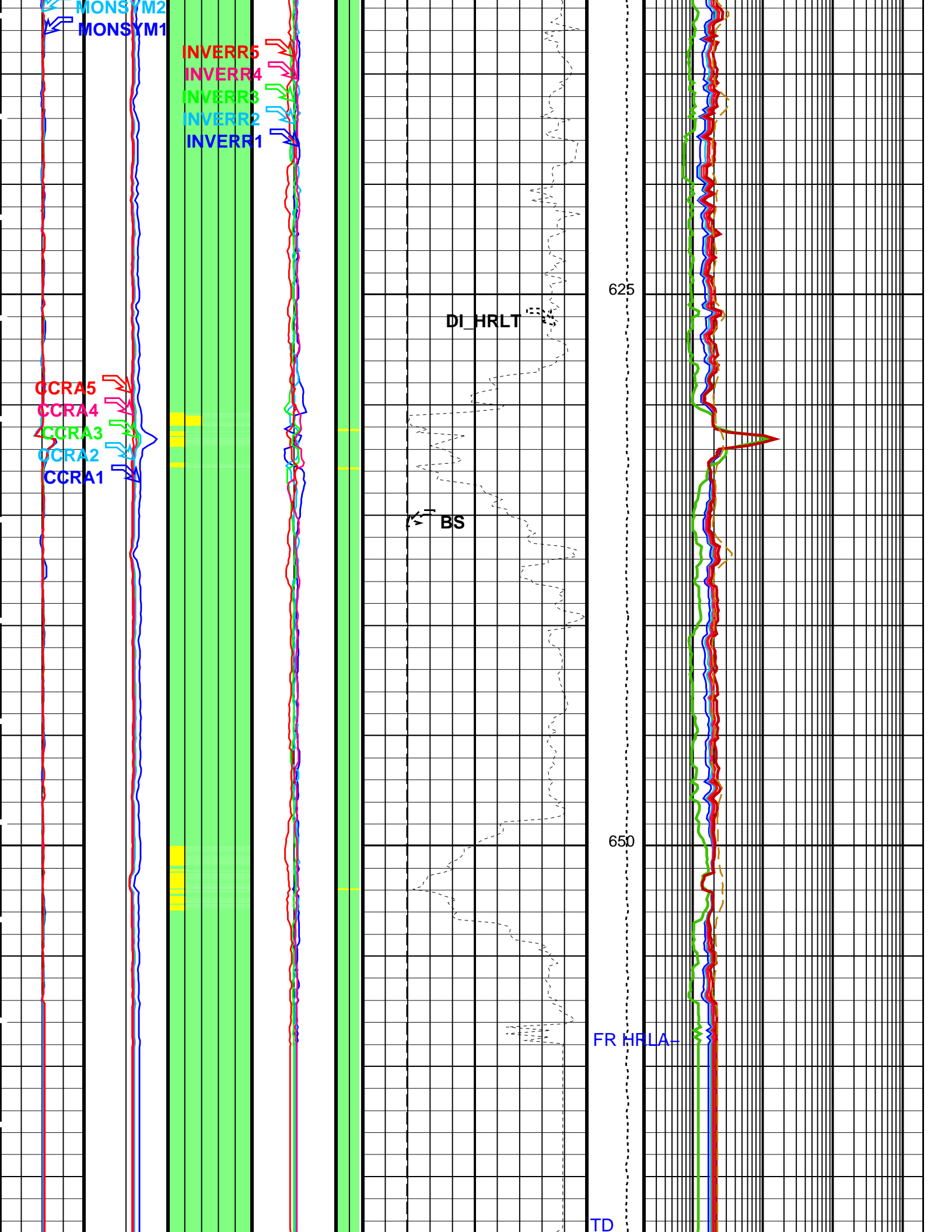
MONSYM5  
MONSYM4  
MONSYM3

TENS

575

600

RM\_HRLT  
RT\_HRLT  
RXO\_HRLT  
RLA5  
RLA4  
RLA3  
RLA2  
RLA1



\*\*\* HRLT FLAG TRACKS \*\*\*

BLACK areas show that the corresponding error flag is set.

TRACK R3\_LQC

INVERSION WEIGHT

Contribution from each hrlt channel in Inversion algorithm, and from left to right :

| Wei1 | Wei2 | Wei3 | Wei4 | Wei5 |

GREEN = OK

YELLOW = Contribution QUESTIONABLE

BLACK = Contribution UNRELIABLE

TRACK R5\_LQC

RESISTIVITY QUALITY INDICATOR

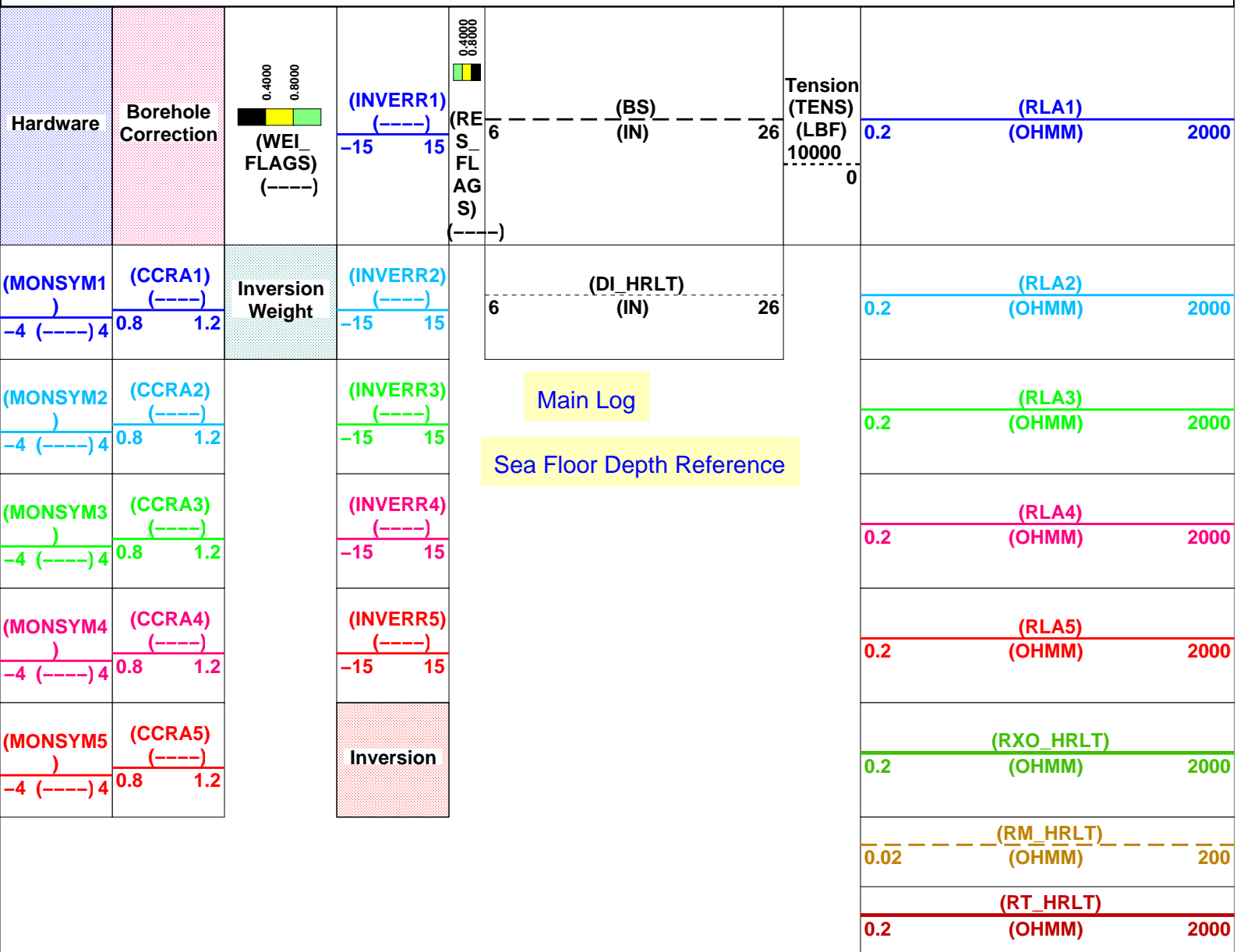
LQC flags on RXO\_HRLT & RT\_HRLT, and from left to right :

| RxoFlag | RTFlag |

GREEN = OK

YELLOW = SHOULDER BED EFFECT

BLACK = NOK



PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
	HNGS-BA: Hostile Natural Gamma Ray Sonde	
BAR1	HNGS Detector 1 Barite Constant	1
BAR2	HNGS Detector 2 Barite Constant	1

BHK	Borehole Status	0	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	50	DEGF
CSD1	Inner Casing Outer Diameter	0	IN
CSD2	Outer Casing Outer Diameter	0	IN
CSW1	Inner Casing Weight	0	LB/F
CSW2	Outer Casing Weight	0	LB/F
DBCC	HNGS Barite Constant Correction Flag	NONE	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
H1P	HNGS Detector 1 Allow/Disallow In Processing	ALLOW	
H2P	HNGS Detector 2 Allow/Disallow In Processing	ALLOW	
HABK	HNGS Borehole Potassium Running Average	-0.00416761	
HALF	HNGS Alpha Filter Length	60	IN
HCRB	HNGS Apply Borehole Potassium Correction	NONE	
HMWM	Mud Weighting Material	NATU	
HNPE	HNGS Processing Enable	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
S1BI	HNGS Detector 1 Calibration Bismuth Count Rate	1.3	CPS
S2BI	HNGS Detector 2 Calibration Bismuth Count Rate	1.3	CPS
SGRC	HNGS Standard Gamma-Ray Correction Flag	YES	
SHT	Surface Hole Temperature	68	DEGF
TPOS	Tool Position	ECCE	
VBA1	HNGS Detector 1 Variable Barite Factor Running Average	0.974112	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	0.970002	

HRLT-B: High Resolution Laterolog Array - B

BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	50	DEGF
CALSTAT	HRLTB Calibration Status	SHALLOW_DONE	
CALTEMP	HRLTB Calibration Temperature	20.4572	DEGC
FREQ0	HRLT Frequency Index for Mode 0	32	
FREQ1	HRLT Frequency Index for Mode 1	128	
FREQ2	HRLT Frequency Index for Mode 2	104	
FREQ3	HRLT Frequency Index for Mode 3	86	
FREQ4	HRLT Frequency Index for Mode 4	56	
FREQ5	HRLT Frequency Index for Mode 5	44	
FREQ6	HRLT Frequency Index for Mode 6	116	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
ISSBAR	Barite Mud Switch	NOBARITE	
KFAC_HRLT	HRLT K Factor Option	SONDE	
LOOPCOEF_S	HRLT Loop Coefficient for Shallow Modes	LOW	
LOOPMOD0	HRLT Mode 0 Loop Mode	OFF	
LOOPMOD1	HRLT Mode 1 Loop Mode	OFF	
LOOPMOD2	HRLT Mode 2 Loop Mode	OFF	
LOOPMOD3	HRLT Mode 3 Loop Mode	OFF	
LOOPMOD4	HRLT Mode 4 Loop Mode	OFF	
LOOPMOD5	HRLT Mode 5 Loop Mode	OFF	
LOOPMOD6	HRLT Mode 6 Loop Mode	OFF	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
PROCMFL	Inversion Selection	ON	
PROCMFL	Inversion Micro-Resistivity Selection	NO_EXTERNAL_RXO	
PROCMFO	Mechanical Standoff Fin Size	0	IN
PROCRM	Processing Mud Resistivity Select	HRLT_Compute	
PROCSPO	Sonde Position	Centered	
SHT	Surface Hole Temperature	68	DEGF

HLDS: Hostile Litho-Density Sonde

CLCL	HLDS LS Control Loop Controller Mode	AUTO_DEFAULT	
CLCS	HLDS SS Control Loop Controller Mode	AUTO_DEFAULT	
CLLS	HLDS Mode Loop Long Spacing	AUTO	
CLSS	HLDS Mode Loop Short Spacing	AUTO	
DHC	Density Hole Correction	BS	
DPPM	Density Porosity Processing Mode	HIRS	
FD	Fluid Density	1	G/C3
LATC	HLDS Activation Correction	OFF	
LLDL	HLDS LS Low Level Discriminator DAC	14000	
LLDS	HLDS SS Low Level Discriminator DAC	14000	
LLML	HLDS LS Low Level Discriminator Mode	AUTO	
LLMS	HLDS SS Low Level Discriminator Mode	AUTO	
MDEN	Matrix Density	2.71	G/C3
PHVL	HLDS Long Spacing High Voltage Setting	1000	V
PHVS	HLDS Short Spacing High Voltage Setting	1000	V
PSDL	HLDS LS Pulse Shape Compensation DAC	30000	
PSDS	HLDS SS Pulse Shape Compensation DAC	30000	
PSML	HLDS LS Pulse Shape Compensation Mode	AUTO	
PSMS	HLDS SS Pulse Shape Compensation Mode	AUTO	

EDTC-B: Enhanced DTS Cartridge

BHEI	Borehole Fluid Type	WATER	
------	---------------------	-------	--

BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	50	DEGF
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DPPM	Density Porosity Processing Mode	HIRS	
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCO	Hole Size Correction Option	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
ISSBAR_EDTC	Nuclear Mud Type	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MWCO	Mud Weight Correction Option	YES	
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0	IN
SOCO	Standoff Correction Option	NO	
TPOS_EDTC	EDTC Tool Centered/Eccentered	Eccentered	
U-ETELM_EDTS	Telemetry Mode for eWAFE	Standard_EDTS	
U-TELM_EDTS	Telemetry Mode for WAFE	Standard_EDTS	
System and Miscellaneous			
ALTDPCHAN	Name of alternate depth channel	SpeedCorrectedDepth	
BS	Bit Size	9.875	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	10.750	IN
CWEI	Casing Weight	43.00	LB/F
DFD	Drilling Fluid Density	1.25	G/C3
DO	Depth Offset for Playback	-1086.0	M
FLEV	Fluid Level	-50000.00	M
MST	Mud Sample Temperature	-50000.00	DEGC
PBVSADP	Use alternate depth channel for playback	NO	
PP	Playback Processing	NORMAL	
RMFS	Resistivity of Mud Filtrate Sample	-50000.0000	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	1765	M
TDD	Total Depth - Driller	1765.00	M
TDL	Total Depth - Logger	1765.00	M
TWS	Temperature of Connate Water Sample	37.78	DEGC

Format: HRLT\_LQC    Vertical Scale: 1:200    Graphics File Created: 15-Jan-2012 07:37

### OP System Version: 19C0-187

HNGC-B	19C0-187	HNGS-BA	19C0-187
HRLT-B	19C0-187	HLDS	19C0-187
LDSC-B	19C0-187	EDTC-B	SKK-5169-EDTCB

#### Input DLIS Files

DEFAULT	NGS_HRLA_LDL_013LUP	FN:14	PRODUCER	15-Jan-2012 05:04	1753.4 M	1073.2 M
---------	---------------------	-------	----------	-------------------	----------	----------

#### Output DLIS Files

DEFAULT	NGS_HRLA_LDL_016PUP	FN:18	PRODUCER	15-Jan-2012 07:37		
BACKUPDLIS	NGS_HRLA_LDL_016PUP	FN:19	PRODUCER	15-Jan-2012 07:37		

#### Input DLIS Files

DEFAULT	Flip_NGS_HRLA_LDL_014LUP		PRODUCER	15-Jan-2012 07:22	1726.3 M	1028.7 M
---------	--------------------------	--	----------	-------------------	----------	----------

#### Output DLIS Files

DEFAULT	NGS_HRLA_LDL_018PUP	FN:22	PRODUCER	15-Jan-2012 07:58	639.2 M	-58.4 M
BACKUPDLIS	NGS_HRLA_LDL_018PUP	FN:23	PRODUCER	15-Jan-2012 07:58	639.2 M	-58.4 M

### OP System Version: 19C0-187

HNGC-B 19C0-187  
 HRLT-B 19C0-187  
 LDSC-B 19C0-187

HNGS-BA  
 HLDS  
 EDTC-B

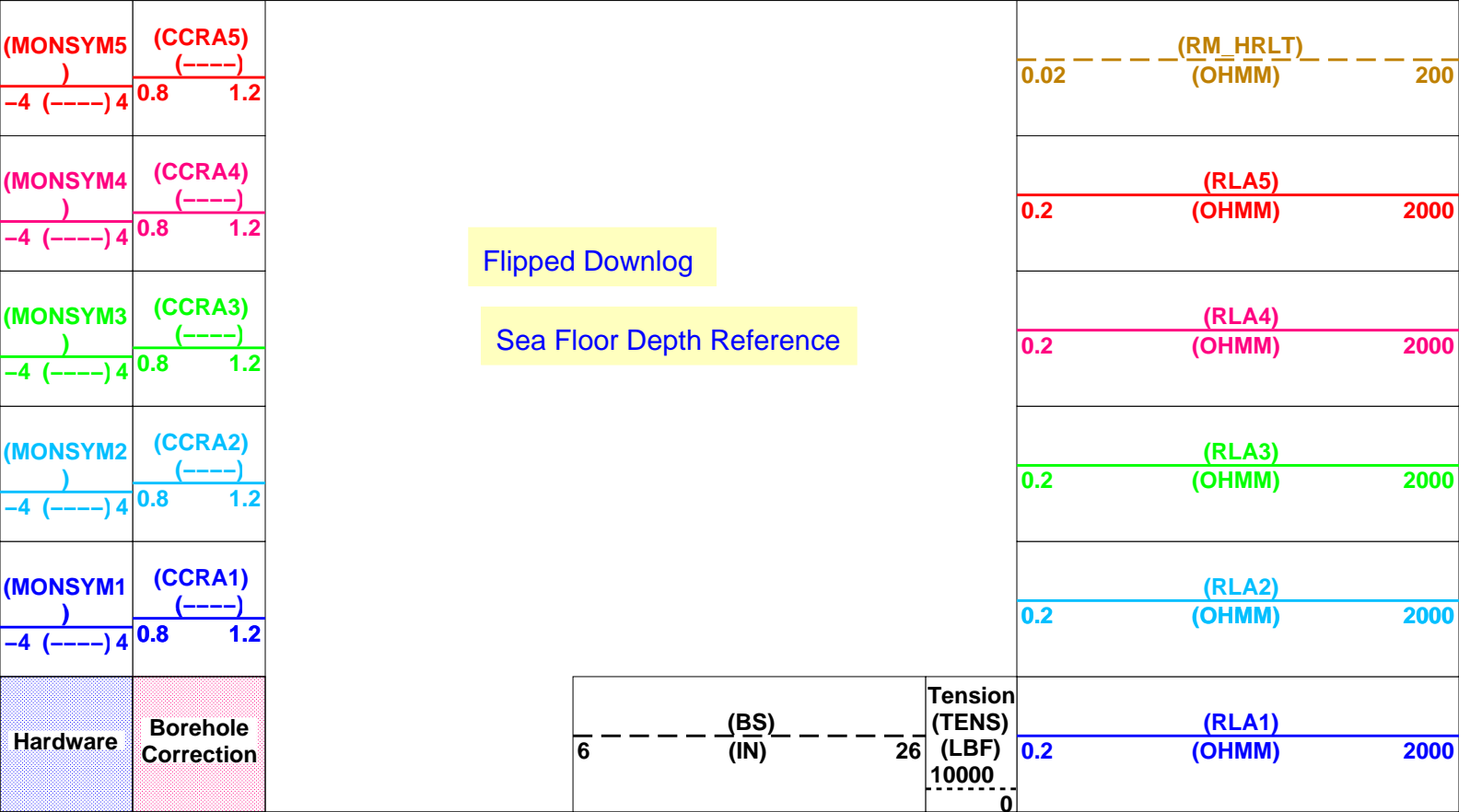
19C0-187  
 19C0-187  
 SKK-5169-EDTCB

### Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
TDD	671.00 M	1765.00 M	107.6 07:59:32
TDL	667.00 M	1765.00 M	64.2 07:59:37

#### PIP SUMMARY

Time Mark Every 60 S



#### \*\*\* HRLT FLAG TRACKS \*\*\*

BLACK areas show that the corresponding error flag is set.

#### TRACK R3\_LQC

#### INVERSION WEIGHT

Contribution from each hrlt channel in Inversion algorithm, and from left to right :

| Wei1 | Wei2 | Wei3 | Wei4 | Wei5 |

GREEN = OK

YELLOW = Contribution QUESTIONABLE

BLACK = Contribution UNRELIABLE

#### TRACK R5\_LQC

#### RESISTIVITY QUALITY INDICATOR

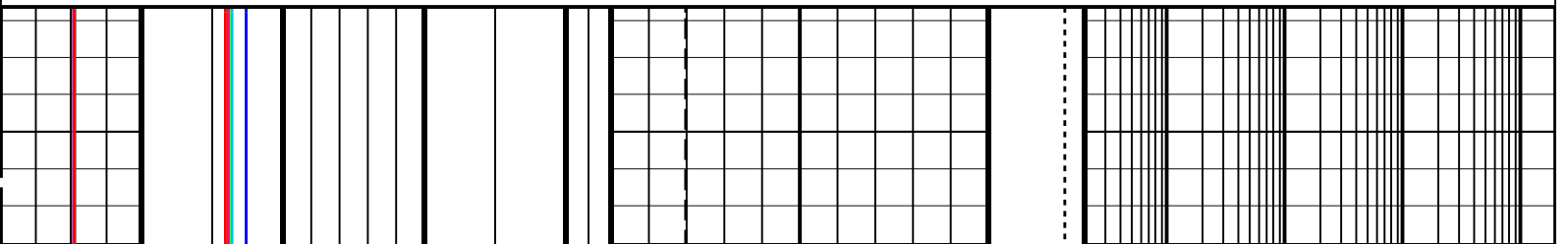
LQC flags on RXO\_HRLT & RT\_HRLT, and from left to right :

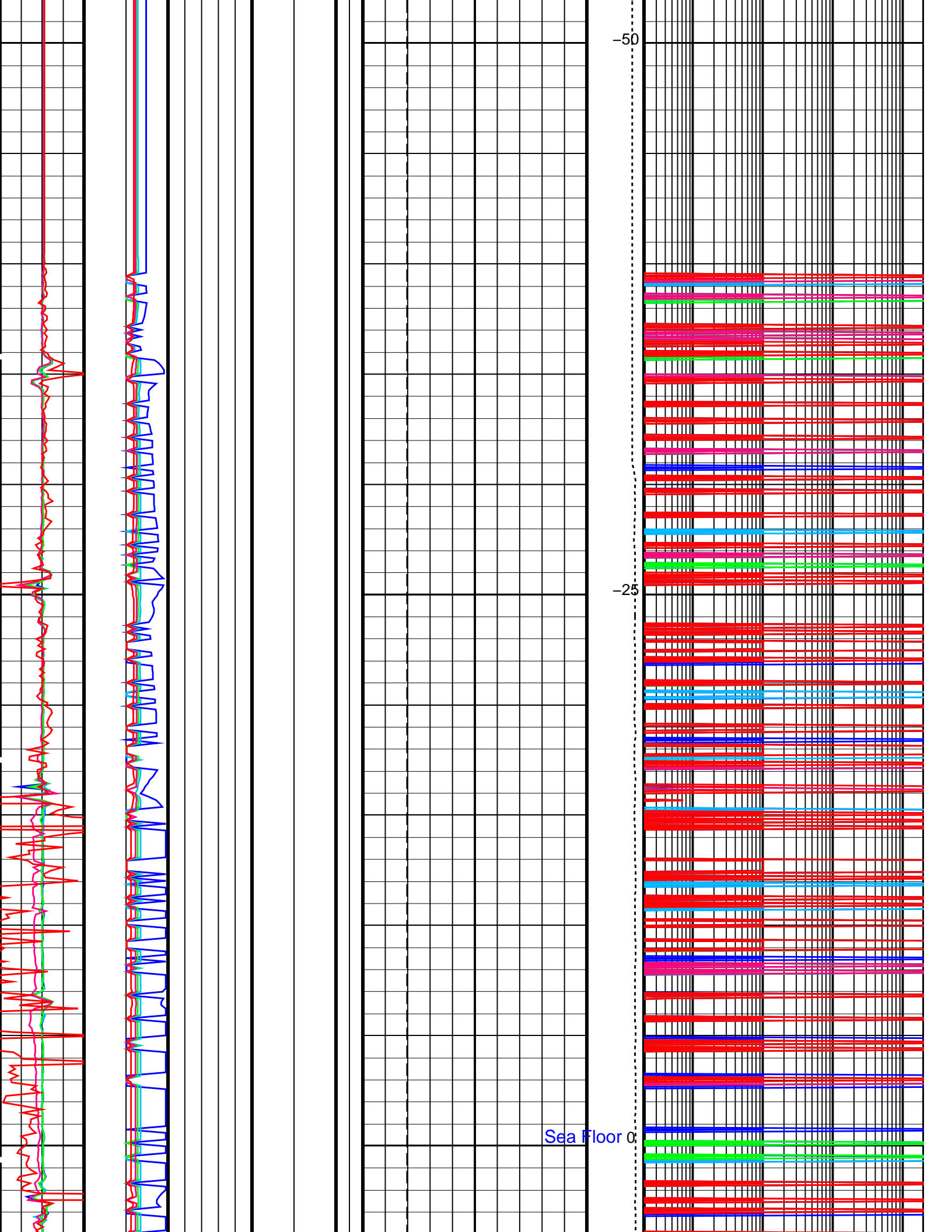
| RxoFlag | RTFlag |

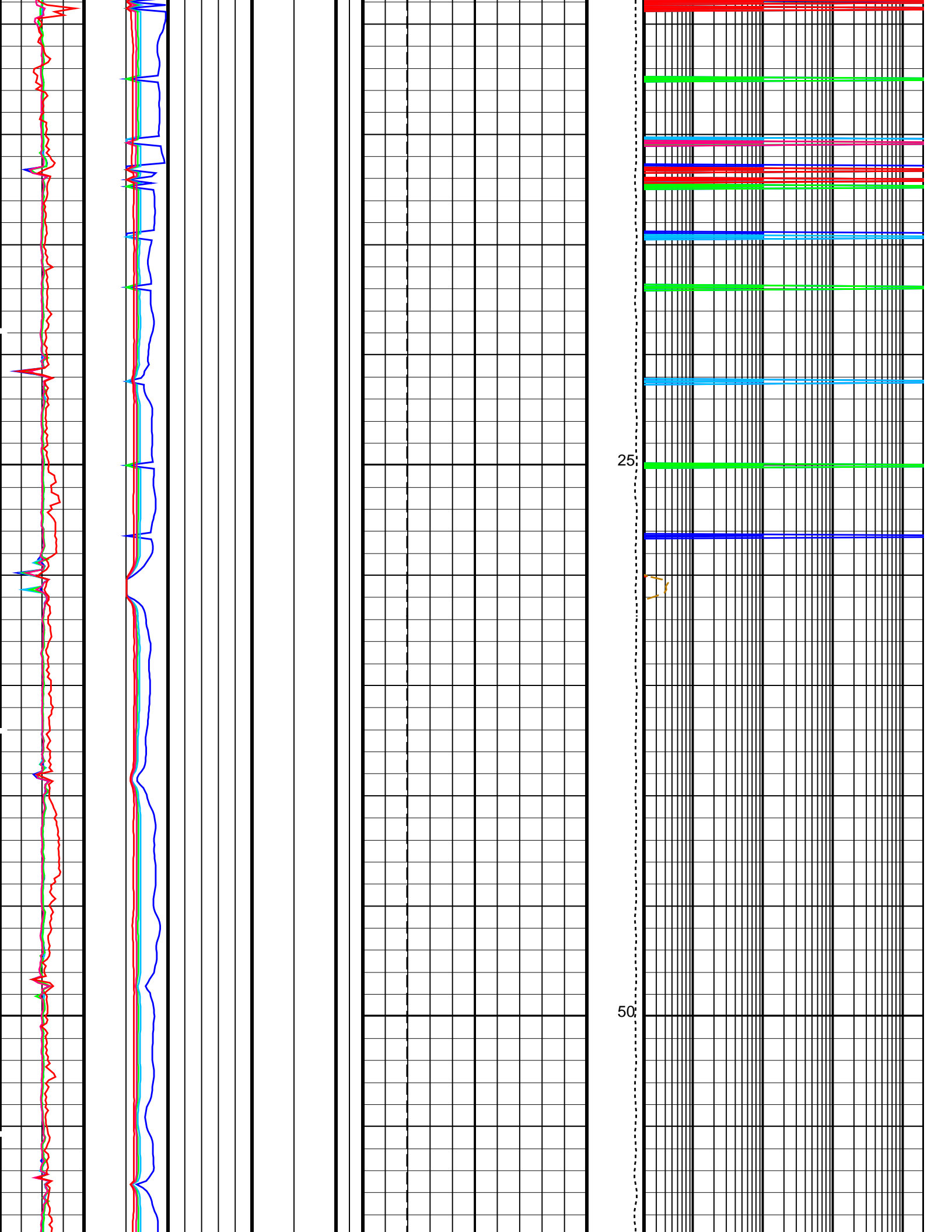
GREEN = OK

YELLOW = SHOULDER BED EFFECT

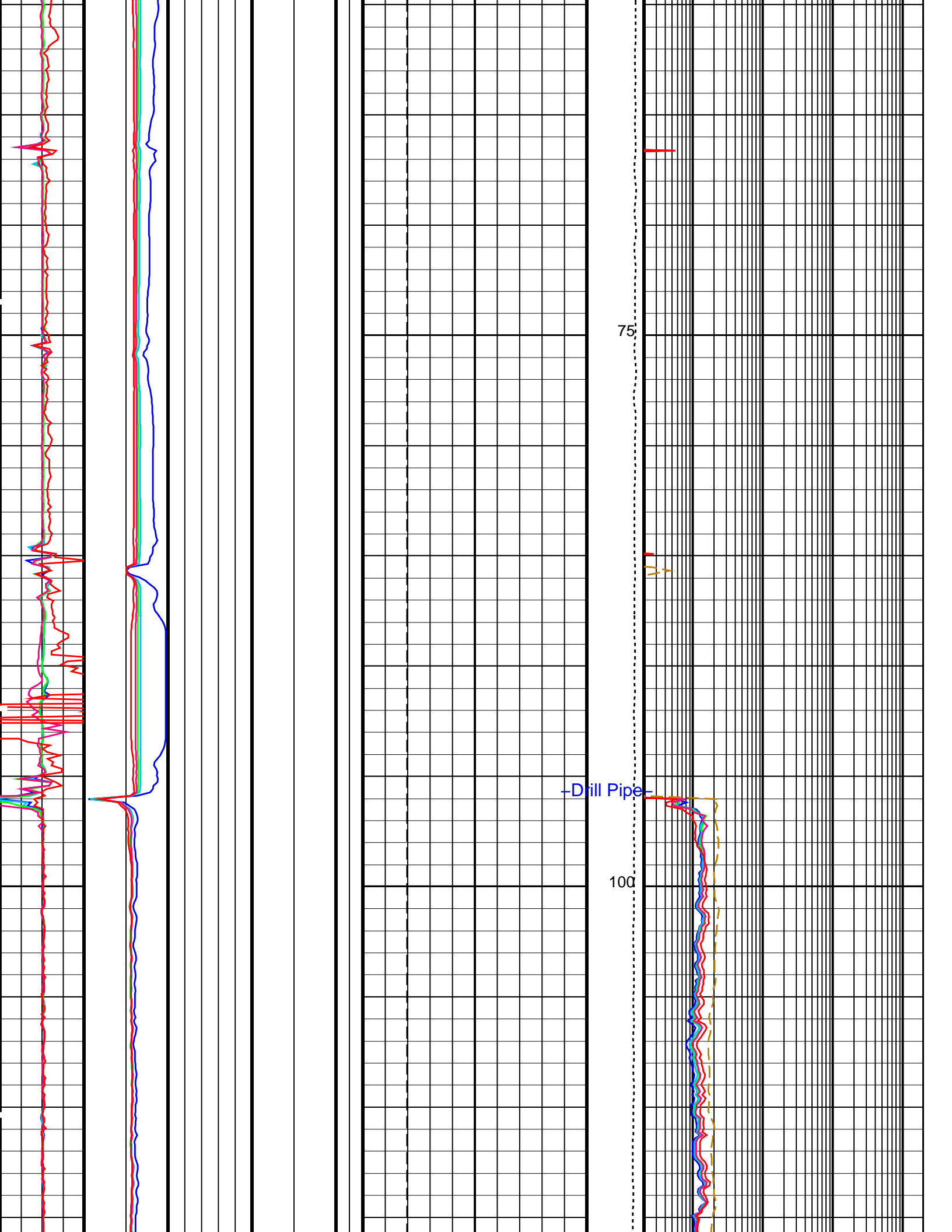
BLACK = NOK

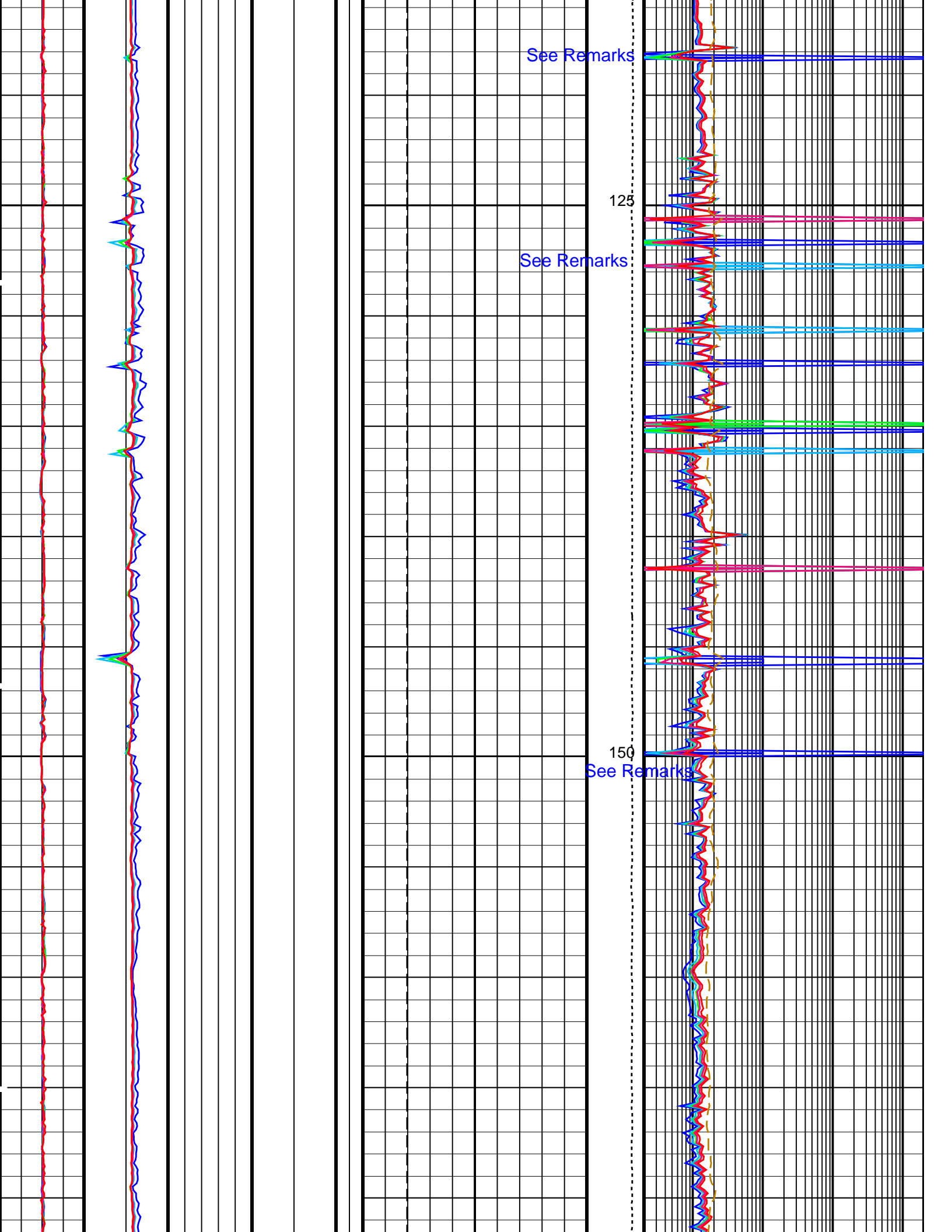


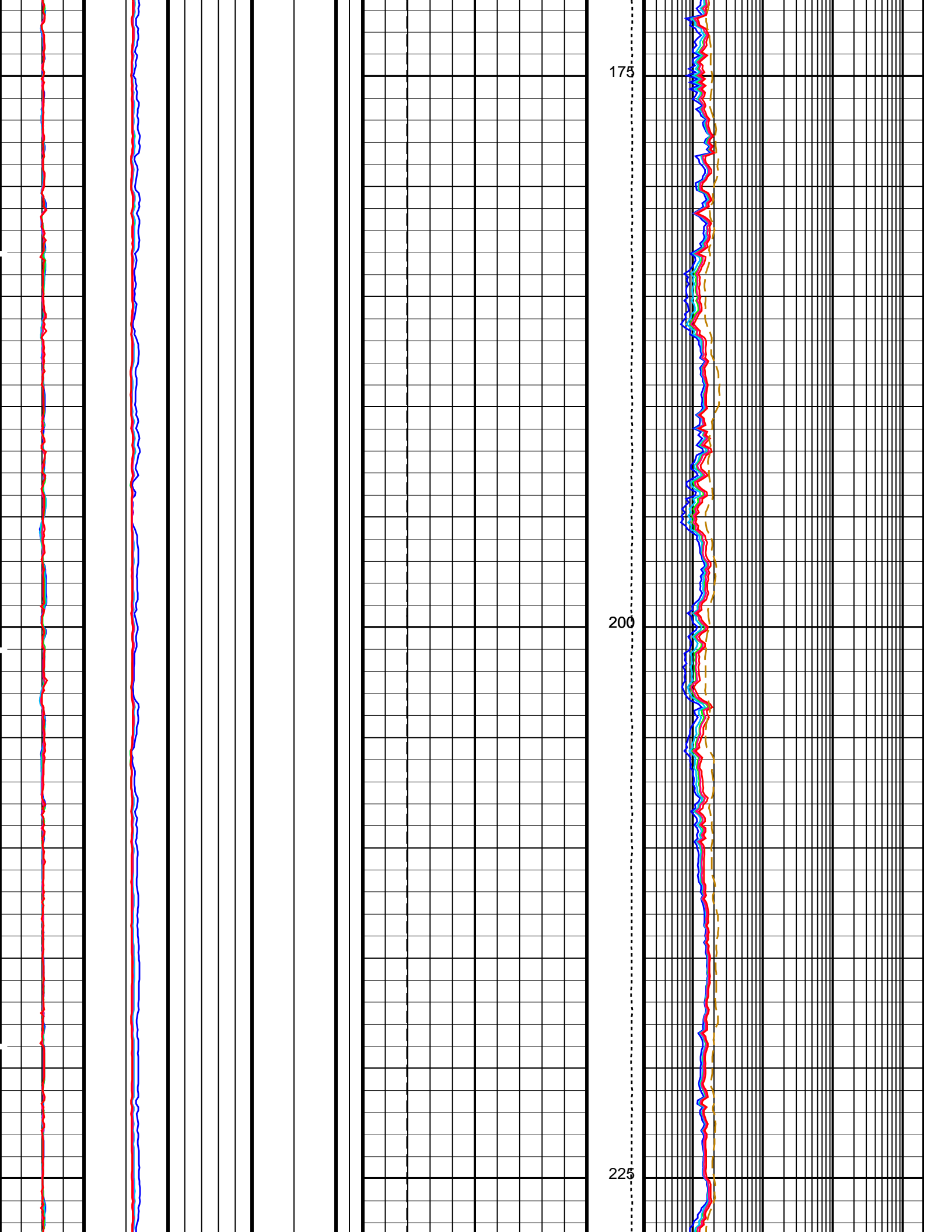


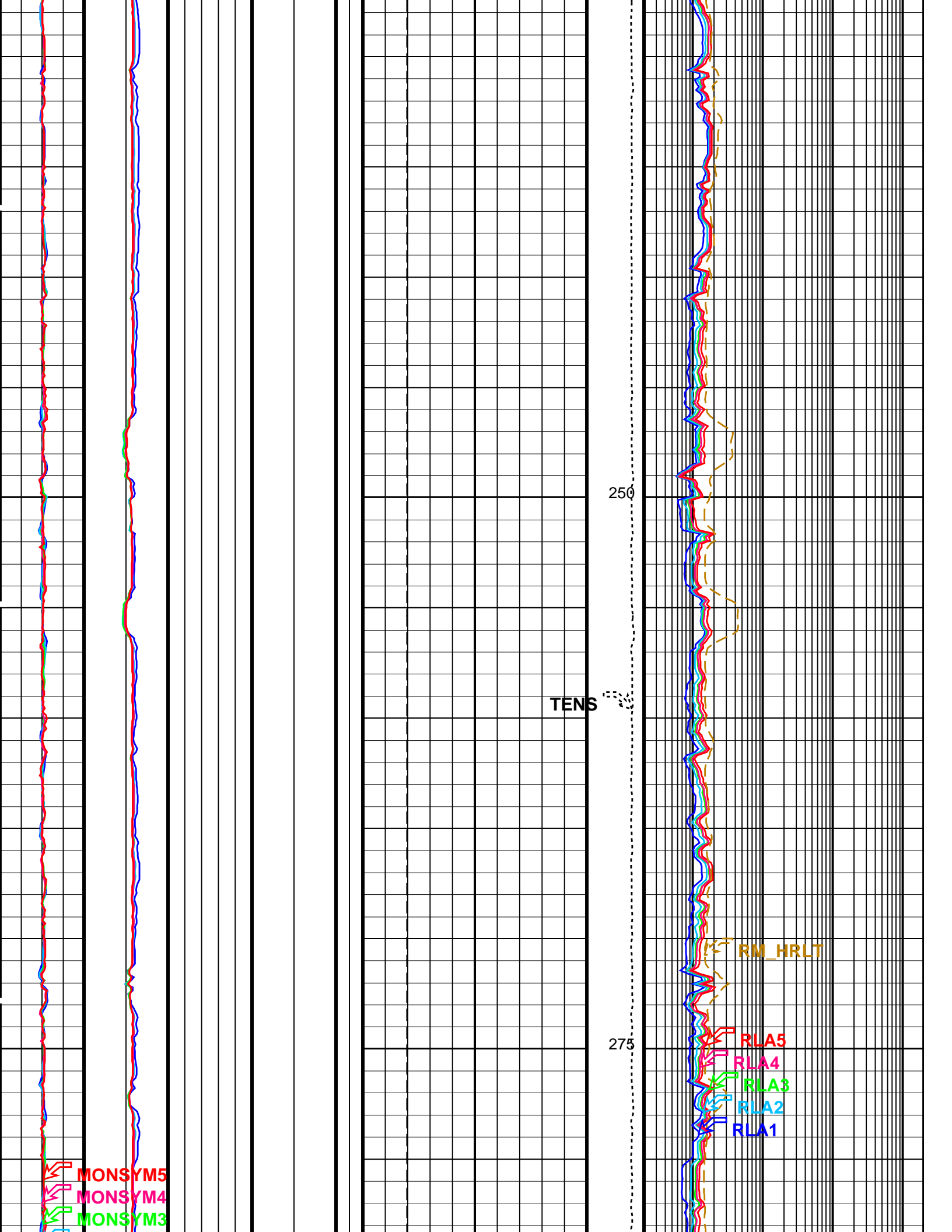


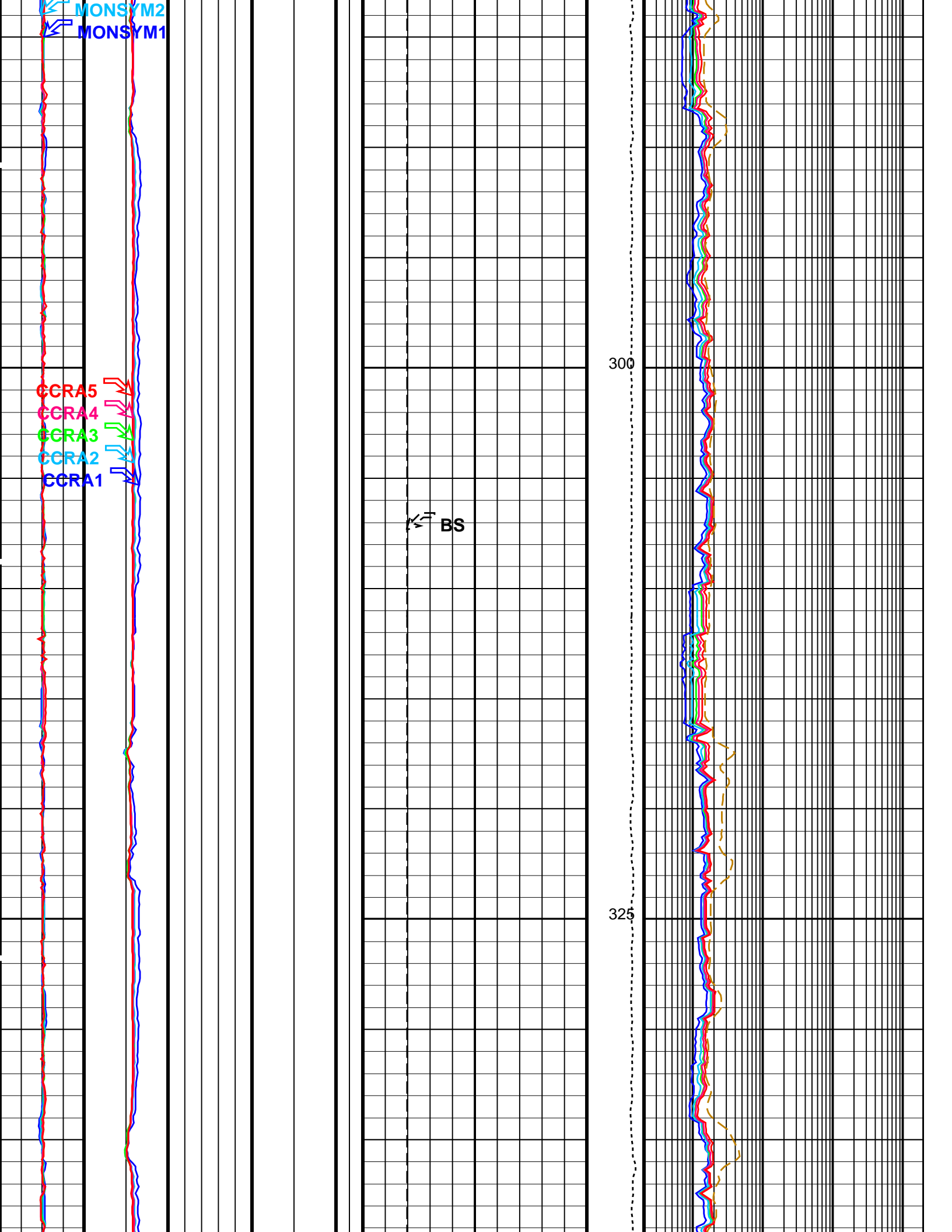


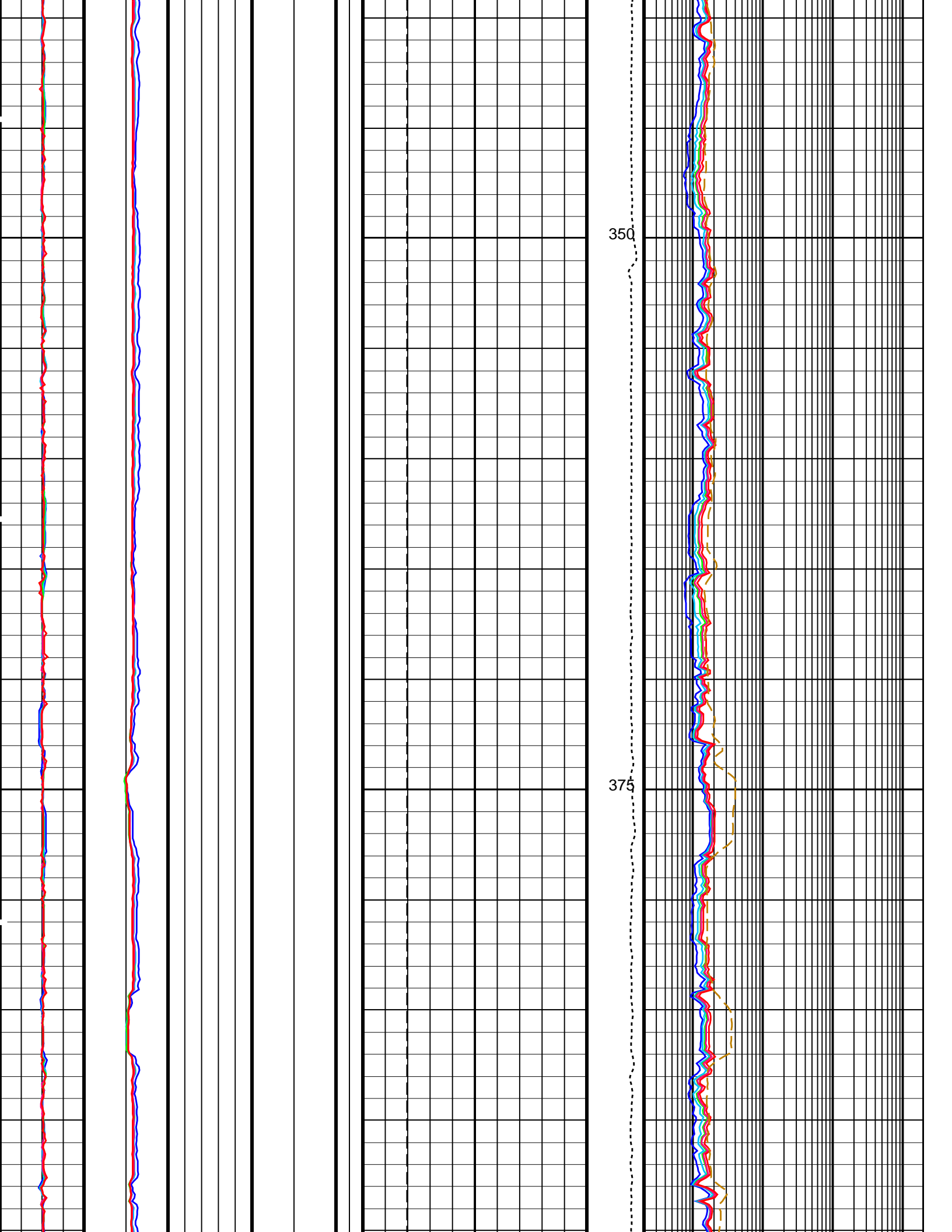


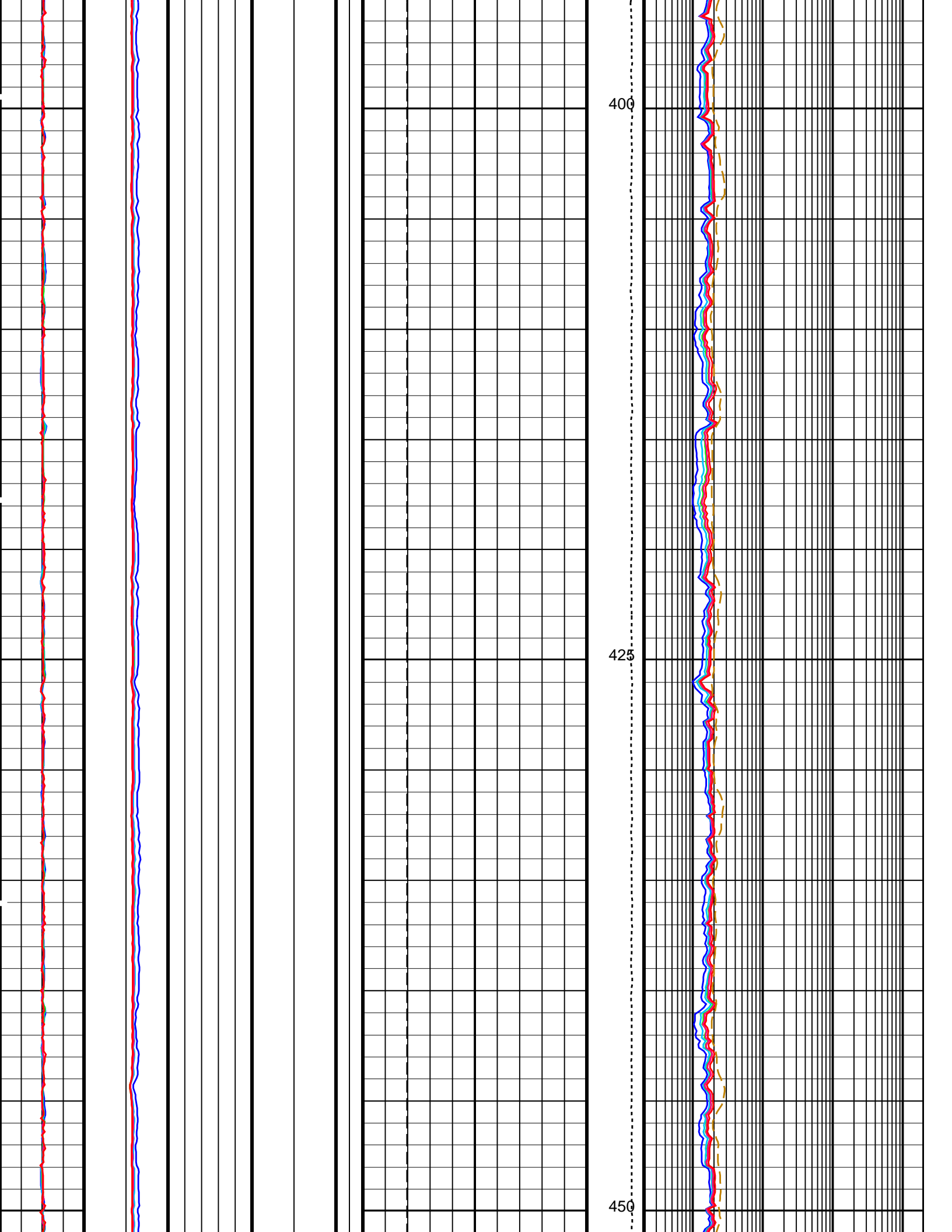


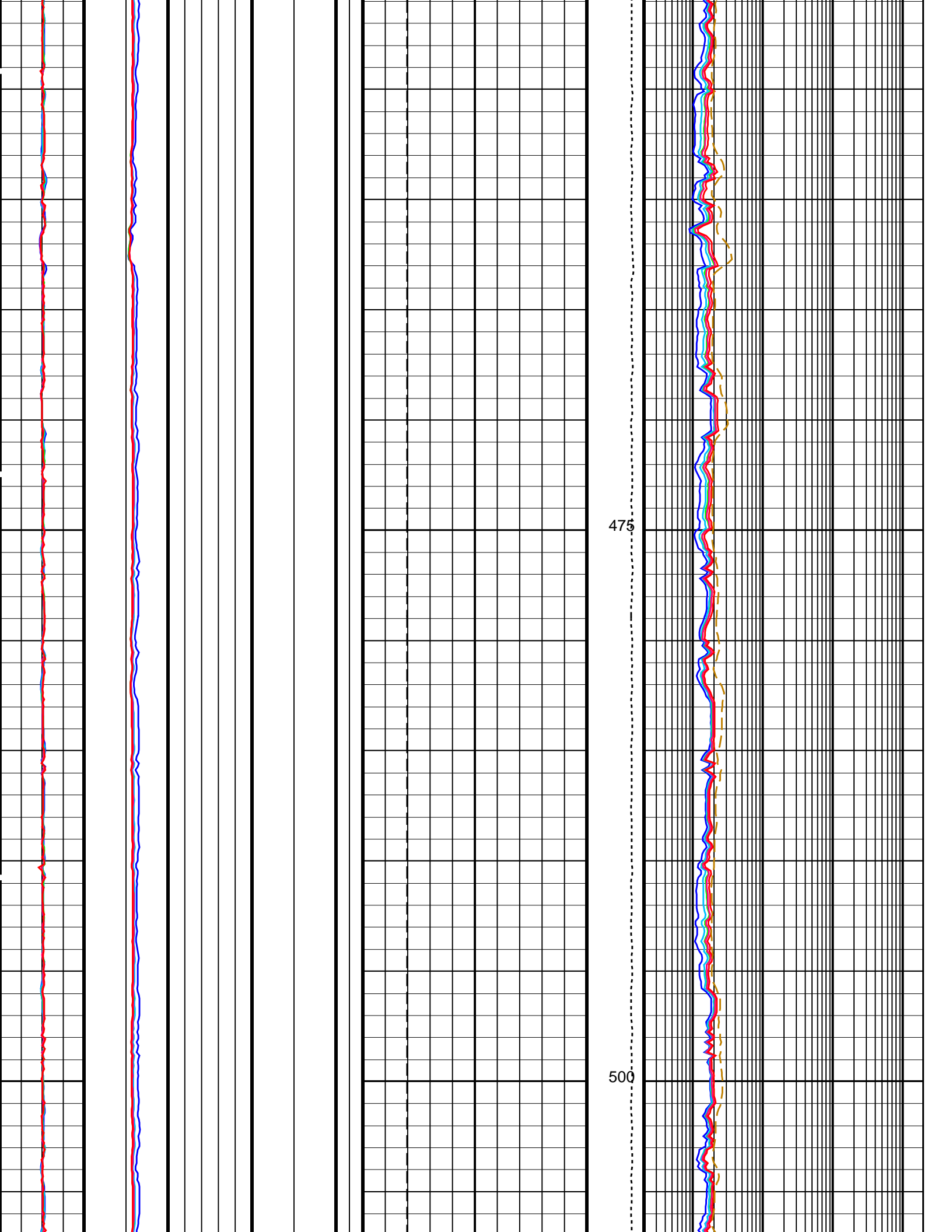




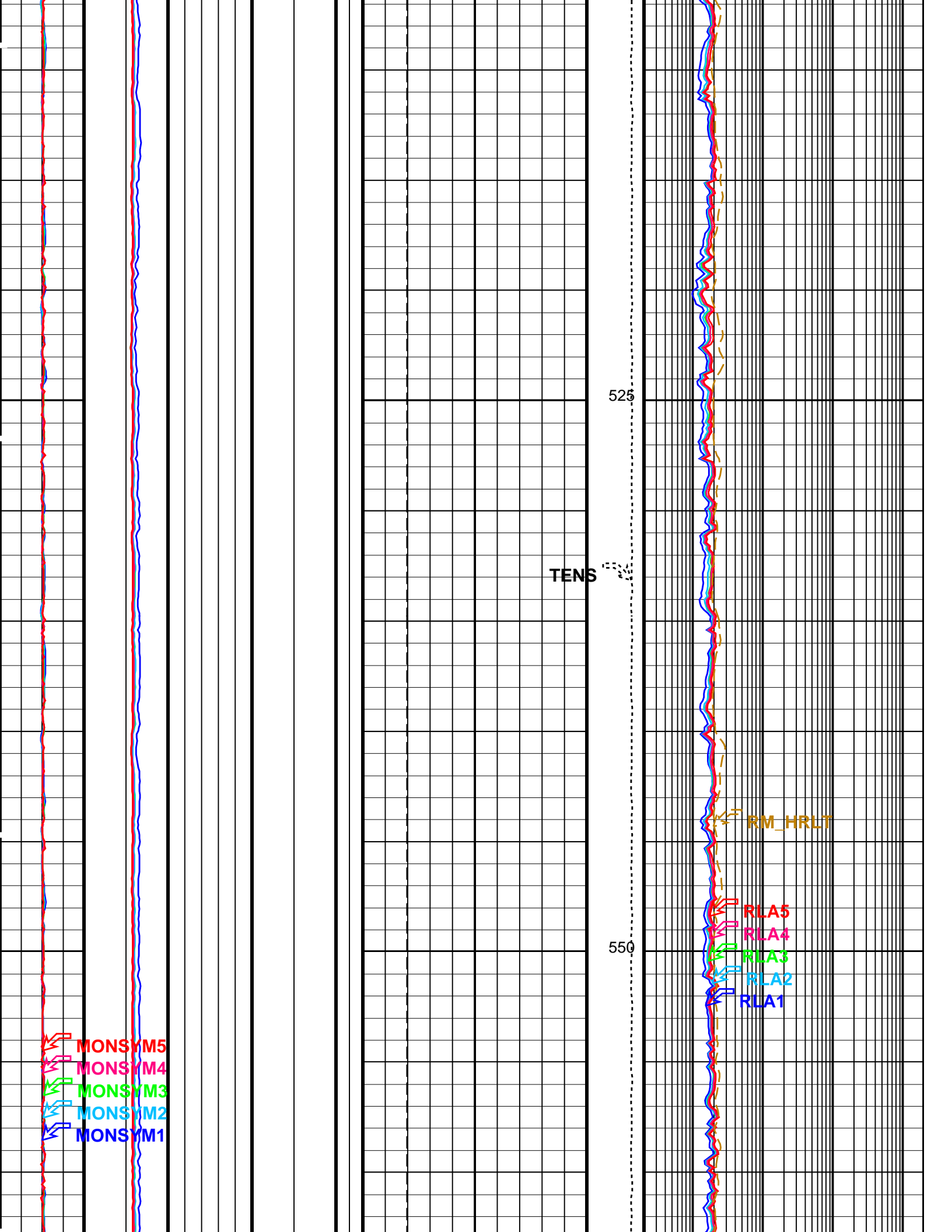










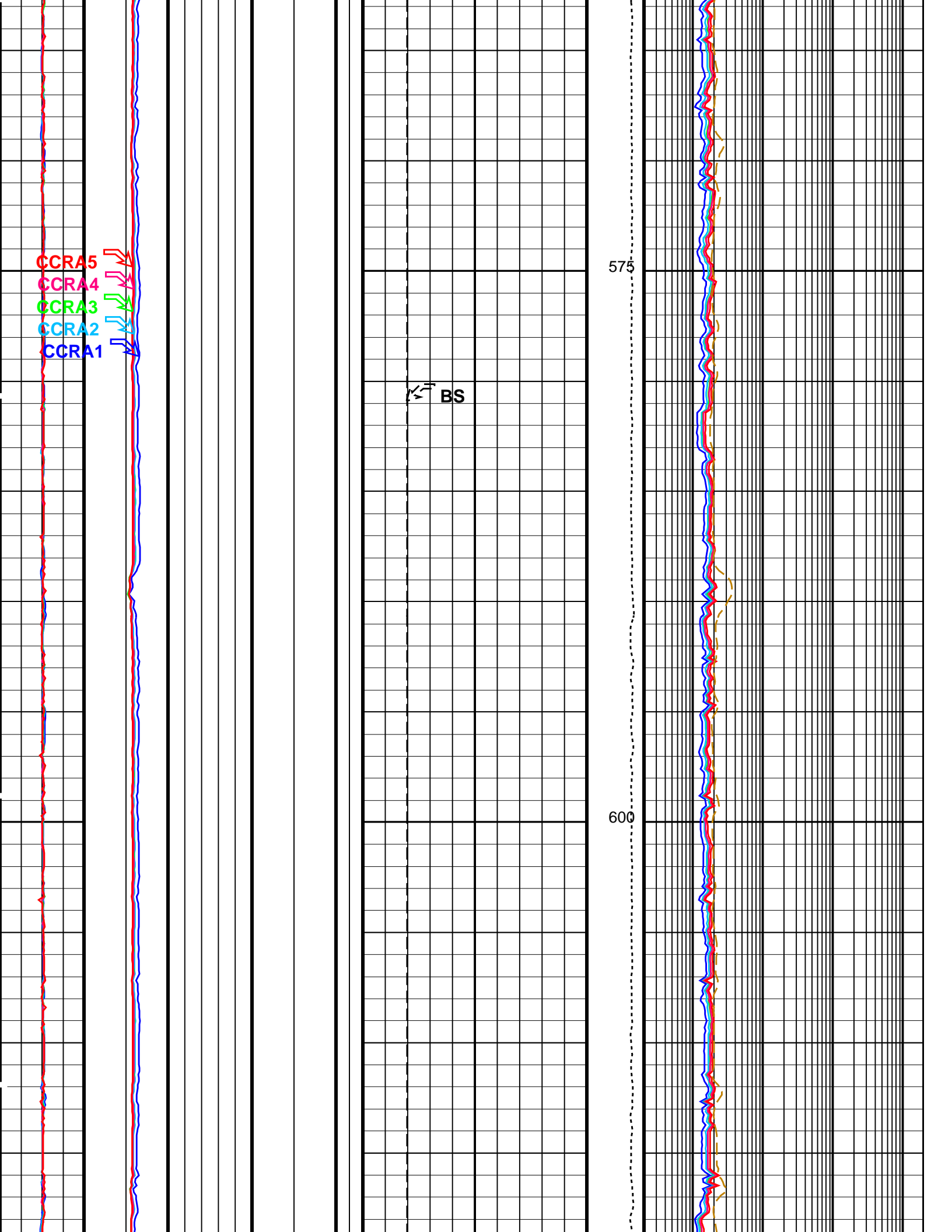


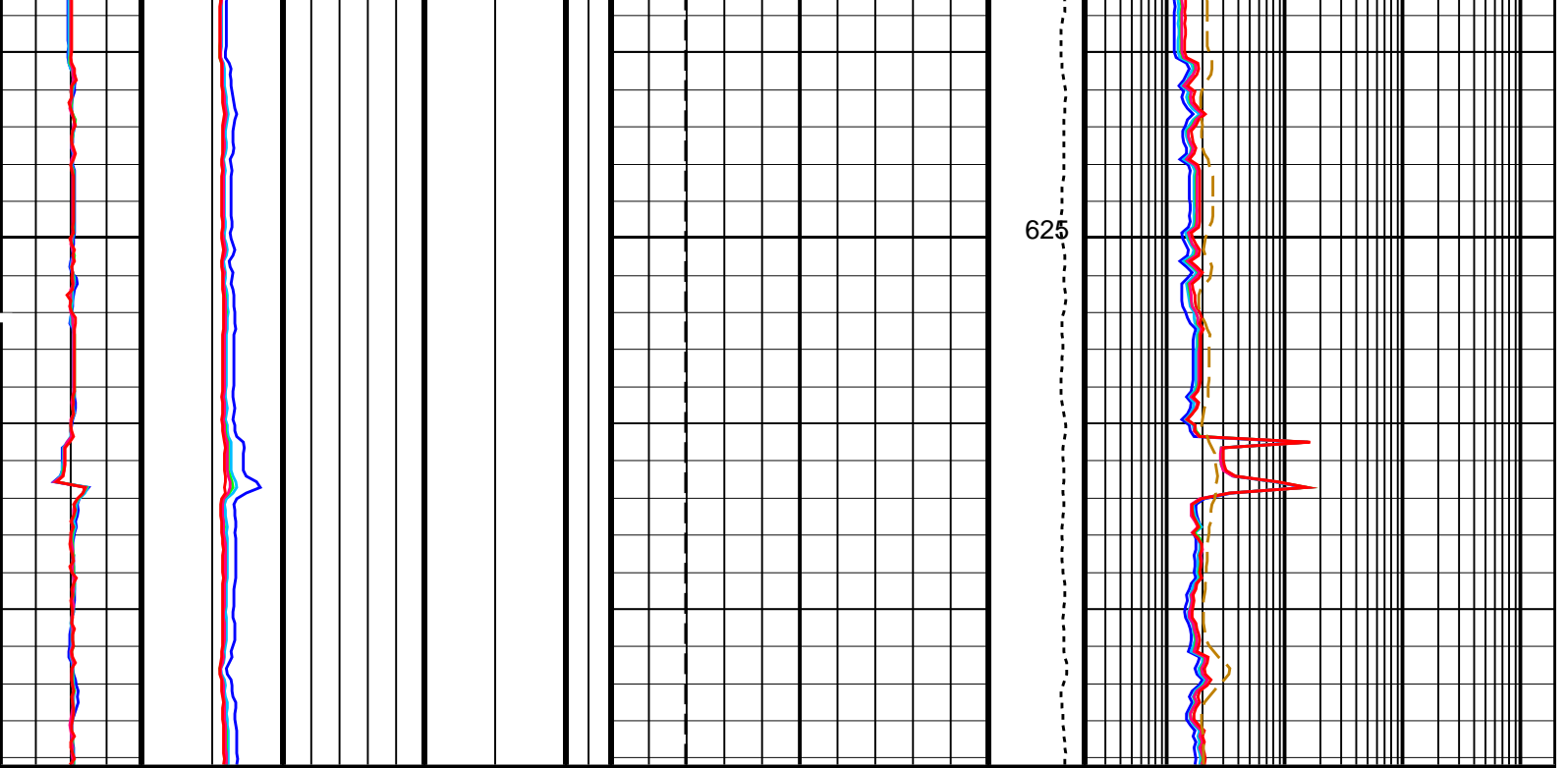
CCRA5  
CCRA4  
CCRA3  
CCRA2  
CCRA1

BS

575

600





\*\*\* HRLT FLAG TRACKS \*\*\*

BLACK areas show that the corresponding error flag is set.

TRACK R3\_LQC

INVERSION WEIGHT

Contribution from each hrlt channel in Inversion algorithm, and from left to right :

| Wei1 | Wei2 | Wei3 | Wei4 | Wei5 |

GREEN = OK

YELLOW = Contribution QUESTIONABLE

BLACK = Contribution UNRELIABLE

TRACK R5\_LQC

RESISTIVITY QUALITY INDICATOR

LQC flags on RXO\_HRLT & RT\_HRLT, and from left to right :

| RxoFlag | RTFlag |

GREEN = OK

YELLOW = SHOULDER BED EFFECT

BLACK = NOK

Hardware	Borehole Correction		(BS) (IN)	Tension (TENS) (LBF)	(RLA1) (OHMM)	2000
(MONSYM1 ) -4 (-----) 4	(CCRA1) (-----) 0.8 1.2	6	26	0.2 10000 0	(RLA2) (OHMM)	2000
(MONSYM2 ) -4 (-----) 4	(CCRA2) (-----) 0.8 1.2	Sea Floor Depth Reference Flipped Downlog			(RLA3) (OHMM)	2000
(MONSYM3 ) -4 (-----) 4	(CCRA3) (-----) 0.8 1.2				(RLA4) (OHMM)	2000
(MONSYM4 ) -4 (-----) 4	(CCRA4) (-----) 0.8 1.2				(RLA5) (OHMM)	2000

PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name Description Value

HNGS-BA: Hostile Natural Gamma Ray Sonde

BAR1	HNGS Detector 1 Barite Constant	1	
BAR2	HNGS Detector 2 Barite Constant	1	
BHK	HNGS Borehole Potassium Correction Concentration	0	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	50	DEGF
CSD1	Inner Casing Outer Diameter	0	IN
CSD2	Outer Casing Outer Diameter	0	IN
CSW1	Inner Casing Weight	0	LB/F
CSW2	Outer Casing Weight	0	LB/F
DBCC	HNGS Barite Constant Correction Flag	NONE	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN 9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
H1P	HNGS Detector 1 Allow/Disallow In Processing	ALLOW	
H2P	HNGS Detector 2 Allow/Disallow In Processing	ALLOW	
HABK	HNGS Borehole Potassium Running Average	-0.00488026	
HALF	HNGS Alpha Filter Length	60	IN
HCRB	HNGS Apply Borehole Potassium Correction	NONE	
HMWM	Mud Weighting Material	BARI	
HNPE	HNGS Processing Enable	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
S1BI	HNGS Detector 1 Calibration Bismuth Count Rate	1.3	CPS
S2BI	HNGS Detector 2 Calibration Bismuth Count Rate	1.3	CPS
SGRC	HNGS Standard Gamma-Ray Correction Flag	YES	
SHT	Surface Hole Temperature	68	DEGF
TPOS	Tool Position	CENT	
VBA1	HNGS Detector 1 Variable Barite Factor Running Average	0.973892	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	0.969842	

HRLT-B: High Resolution Laterolog Array - B

BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	50	DEGF
CALSTAT	HRLTB Calibration Status	SHALLOW_DONE	
CALTEMP	HRLTB Calibration Temperature	20.4572	DEGC
FREQ0	HRLT Frequency Index for Mode 0	32	
FREQ1	HRLT Frequency Index for Mode 1	128	
FREQ2	HRLT Frequency Index for Mode 2	104	
FREQ3	HRLT Frequency Index for Mode 3	86	
FREQ4	HRLT Frequency Index for Mode 4	56	
FREQ5	HRLT Frequency Index for Mode 5	44	
FREQ6	HRLT Frequency Index for Mode 6	116	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN 9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
ISSBAR	Barite Mud Switch	NOBARITE	
KFAC_HRLT	HRLT K Factor Option	SONDE	
LOOPCOEF_S	HRLT Loop Coefficient for Shallow Modes	LOW	
LOOPMOD0	HRLT Mode 0 Loop Mode	OFF	
LOOPMOD1	HRLT Mode 1 Loop Mode	OFF	
LOOPMOD2	HRLT Mode 2 Loop Mode	OFF	
LOOPMOD3	HRLT Mode 3 Loop Mode	OFF	
LOOPMOD4	HRLT Mode 4 Loop Mode	OFF	
LOOPMOD5	HRLT Mode 5 Loop Mode	OFF	
LOOPMOD6	HRLT Mode 6 Loop Mode	OFF	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
PROCVN	Inversion Selection	OFF	
PROCMFL	Inversion Micro-Resistivity Selection	NO_EXTERNAL_RXO	
PROCMSO	Mechanical Standoff Fin Size	0	IN
PROCRM	Processing Mud Resistivity Select	HRLT_Compute	
PROCSPO	Sonde Position	Centered	
SHT	Surface Hole Temperature	68	DEGF

HLDS: Hostile Litho-Density Sonde

CLCL	HLDS LS Control Loop Controller Mode	AUTO_DEFAULT	
CLCS	HLDS SS Control Loop Controller Mode	AUTO_DEFAULT	
CLLS	HLDS Mode Loop Long Spacing	AUTO	

CLSS	HLDS Mode Loop Short Spacing	AUTO	
DHC	Density Hole Correction	BS	
DPPM	Density Porosity Processing Mode	HIRS	
FD	Fluid Density	1	G/C3
LATC	HLDS Activation Correction	OFF	
LLDL	HLDS LS Low Level Discriminator DAC	14000	
LLDS	HLDS SS Low Level Discriminator DAC	14000	
LLML	HLDS LS Low Level Discriminator Mode	AUTO	
LLMS	HLDS SS Low Level Discriminator Mode	AUTO	
MDEN	Matrix Density	2.71	G/C3
PHVL	HLDS Long Spacing High Voltage Setting	1000	V
PHVS	HLDS Short Spacing High Voltage Setting	1000	V
PSDL	HLDS LS Pulse Shape Compensation DAC	30000	
PSDS	HLDS SS Pulse Shape Compensation DAC	30000	
PSML	HLDS LS Pulse Shape Compensation Mode	AUTO	
PSMS	HLDS SS Pulse Shape Compensation Mode	AUTO	
<b>EDTC-B: Enhanced DTS Cartridge</b>			
BHFL	Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	50	DEGF
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DPPM	Density Porosity Processing Mode	HIRS	
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN 9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCO	Hole Size Correction Option	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
ISSBAR_EDTC	Nuclear Mud Type	BARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MWCO	Mud Weight Correction Option	YES	
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0	IN
SOCO	Standoff Correction Option	NO	
TPOS_EDTC	EDTC Tool Centered/Eccentered	Eccentered	
U-ETELM_EDTS	Telemetry Mode for eWAFE	Standard_EDTS	
U-TELM_EDTS	Telemetry Mode for WAFE	Standard_EDTS	
<b>System and Miscellaneous</b>			
ALDTPCHAN	Name of alternate depth channel	SpeedCorrectedDepth	
BS	Bit Size	9.875	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	10.750	IN
CWEI	Casing Weight	43.00	LB/F
DFD	Drilling Fluid Density	1.25	G/C3
DO	Depth Offset for Playback	-1087.0	M
FLEV	Fluid Level	-50000.00	M
MST	Mud Sample Temperature	-50000.00	DEGC
PBVSADP	Use alternate depth channel for playback	NO	
PP	Playback Processing	NORMAL	
RMFS	Resistivity of Mud Filtrate Sample	-50000.0000	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	1765	M
TDD	Total Depth - Driller	1765.00	M
TDL	Total Depth - Logger	1765.00	M
TWS	Temperature of Connate Water Sample	37.78	DEGC

Format: HRLT\_LQC    Vertical Scale: 1:200    Graphics File Created: 15-Jan-2012 07:58

### OP System Version: 19C0-187

HNGC-B	19C0-187	HNGS-BA	19C0-187
HRLT-B	19C0-187	HLDS	19C0-187
LDSC-B	19C0-187	EDTC-B	SKK-5169-EDTCB

### Input DLIS Files

DEFAULT	Flip_NGS_HRLA_LDL_014LUP	PRODUCER	15-Jan-2012 07:22	1726.3 M	1028.7 M
---------	--------------------------	----------	-------------------	----------	----------

### Output DLIS Files

DEFAULT	NGS_HRLA_LDL_018PUP	FN:22	PRODUCER	15-Jan-2012 07:58
BACKUPDLIS	NGS_HRLA_LDL_018PUP	FN:23	PRODUCER	15-Jan-2012 07:58

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
-------------	---------	--------	--------	-------	--------	-------	-------

Hostile Natural Gamma Ray Sonde Wellsite Calibration – Detector 1 Check

Master: 7-Jan-2012 4:44 Before: 7-Jan-2012 4:51 After: 7-Jan-2012 4:55

Na 511 Peak Loc	40.00	39.70	39.60	39.67	0.07420	1.000	
Na 511 Peak Res	15.50	14.54	15.72	14.52	-1.200	2.000	%
High Voltage	1150	1164	1164	1165	1.242	N/A	V
Na 1785 Peak Loc	142.6	142.8	141.9	142.4	0.4669	7.000	
Na 1785 Peak Res	8.500	8.009	7.428	9.127	1.699	2.000	%
Temperature	15.50	20.95	20.87	20.87	0	N/A	DEGC
Na Count Rate	45.00	21.00	21.59	21.17	-0.4197	8.000	CPS

Hostile Natural Gamma Ray Sonde Wellsite Calibration – Detector 2 Check

Master: 7-Jan-2012 4:44 Before: 7-Jan-2012 4:51 After: 7-Jan-2012 4:55

Na 511 Peak Loc	40.00	39.71	39.51	39.47	-0.03513	1.000	
Na 511 Peak Res	15.50	15.37	15.57	15.81	0.2371	2.000	%
High Voltage	1150	1091	1090	1089	-0.07922	N/A	V
Na 1785 Peak Loc	142.6	142.7	141.7	141.6	-0.06053	7.000	
Na 1785 Peak Res	8.500	7.507	7.898	8.025	0.1269	2.000	%
Temperature	15.50	21.06	21.04	21.06	0.02601	N/A	DEGC
Na Count Rate	45.00	20.73	21.49	20.79	-0.7021	8.000	CPS

Hostile Natural Gamma Ray Sonde Wellsite Calibration – Ratio Of Detector 1 To Detector 2

Master: 7-Jan-2012 4:44 Before: 7-Jan-2012 4:51 After: 7-Jan-2012 4:55

Coincidence Count Rate Ratio	1.000	1.014	1.001	1.019	0.01773	0.05000	
------------------------------	-------	-------	-------	-------	---------	---------	--

High Resolution Laterolog Array – B Wellsite Calibration – HRLT M01

Before: 15-Jan-2012 3:14 After: 15-Jan-2012 7:34

HRLT M0-M1 Voltage Plus – 0	0	N/A	-319.7	-318.5	1.203	9.681	UV
HRLT M0-M1 Voltage Plus – 1	0	N/A	-336.9	-334.8	2.149	9.681	UV
HRLT M0-M1 Voltage Plus – 2	0	N/A	-337.1	-334.1	3.007	9.681	UV
HRLT M0-M1 Voltage Plus – 3	0	N/A	-339.6	-337.5	2.090	9.681	UV
HRLT M0-M1 Voltage Plus – 4	0	N/A	-327.0	-325.4	1.580	9.681	UV
HRLT M0-M1 Voltage Plus – 5	0	N/A	-322.6	-321.4	1.239	9.681	UV
HRLT M0-M1 Voltage Plus – 6	0	N/A	327.3	325.0	-2.256	9.681	UV
HRLT M0-M1 Voltage Plus – 7	0	N/A	-322.7	-322.7	0	9.681	UV

High Resolution Laterolog Array – B Wellsite Calibration – HRLT M12

Before: 15-Jan-2012 3:14 After: 15-Jan-2012 7:34

HRLT M1-M2 Voltage Plus – 0	0	N/A	1757	1754	-3.424	53.42	UV
HRLT M1-M2 Voltage Plus – 1	0	N/A	1851	1841	-10.51	53.42	UV
HRLT M1-M2 Voltage Plus – 2	0	N/A	1848	1832	-15.16	53.42	UV
HRLT M1-M2 Voltage Plus – 3	0	N/A	1861	1852	-8.751	53.42	UV
HRLT M1-M2 Voltage Plus – 4	0	N/A	1794	1788	-5.676	53.42	UV
HRLT M1-M2 Voltage Plus – 5	0	N/A	1771	1768	-3.766	53.42	UV
HRLT M1-M2 Voltage Plus – 6	0	N/A	-1806	-1794	12.05	53.42	UV
HRLT M1-M2 Voltage Plus – 7	0	N/A	1781	1781	0	53.42	UV

High Resolution Laterolog Array – B Wellsite Calibration – HRLT M23

Before: 15-Jan-2012 3:14 After: 15-Jan-2012 7:34

HRLT M2-M3 Voltage Plus – 0	0	N/A	1743	1740	-3.191	53.42	UV
HRLT M2-M3 Voltage Plus – 1	0	N/A	1848	1838	-10.76	53.42	UV
HRLT M2-M3 Voltage Plus – 2	0	N/A	1846	1831	-15.12	53.42	UV
HRLT M2-M3 Voltage Plus – 3	0	N/A	1863	1855	-8.475	53.42	UV
HRLT M2-M3 Voltage Plus – 4	0	N/A	1789	1783	-5.630	53.42	UV
HRLT M2-M3 Voltage Plus – 5	0	N/A	1768	1765	-3.171	53.42	UV
HRLT M2-M3 Voltage Plus – 6	0	N/A	-1792	-1781	11.60	53.42	UV
HRLT M2-M3 Voltage Plus – 7	0	N/A	1781	1781	0	53.42	UV

High Resolution Laterolog Array – B Wellsite Calibration – HRLT V34

Before: 15-Jan-2012 3:14 After: 15-Jan-2012 7:34

HRLT A3-A4 Voltage Plus – 0	0	N/A	68530	68400	-126.1	2100	UV
HRLT A3-A4 Voltage Plus – 1	0	N/A	72470	72060	-406.0	2100	UV
HRLT A3-A4 Voltage Plus – 2	0	N/A	72660	72100	-558.7	2100	UV
HRLT A3-A4 Voltage Plus – 3	0	N/A	73620	73270	-343.8	2100	UV
HRLT A3-A4 Voltage Plus – 4	0	N/A	70660	70450	-219.3	2100	UV
HRLT A3-A4 Voltage Plus – 5	0	N/A	69840	69710	-133.3	2100	UV
HRLT A3-A4 Voltage Plus – 6	0	N/A	-69280	-68830	453.3	2100	UV
HRLT A3-A4 Voltage Plus – 7	0	N/A	70000	70000	0	2100	UV

High Resolution Laterolog Array – B Wellsite Calibration – HRLT V45

Before: 15-Jan-2012 3:14 After: 15-Jan-2012 7:34

HRLT A4-A5 Voltage Plus – 0	0	N/A	68810	68680	-124.2	2100	UV
HRLT A4-A5 Voltage Plus – 1	0	N/A	72850	72450	-400.5	2100	UV

HRLT A4-A5 Voltage Plus - 1	0	N/A	72850	72450	-400.5	2100	UV
HRLT A4-A5 Voltage Plus - 2	0	N/A	73030	72460	-565.2	2100	UV
HRLT A4-A5 Voltage Plus - 3	0	N/A	73960	73610	-353.7	2100	UV
HRLT A4-A5 Voltage Plus - 4	0	N/A	70950	70740	-210.6	2100	UV
HRLT A4-A5 Voltage Plus - 5	0	N/A	70120	69980	-145.0	2100	UV
HRLT A4-A5 Voltage Plus - 6	0	N/A	-69660	-69200	467.2	2100	UV
HRLT A4-A5 Voltage Plus - 7	0	N/A	70000	70000	0	2100	UV

High Resolution Laterolog Array - B Wellsite Calibration - HRLT V56

Before: 15-Jan-2012 3:14 After: 15-Jan-2012 7:34

HRLT A5-A6 Voltage Plus - 0	0	N/A	68710	68590	-118.6	2100	UV
HRLT A5-A6 Voltage Plus - 1	0	N/A	72580	72180	-400.5	2100	UV
HRLT A5-A6 Voltage Plus - 2	0	N/A	72780	72220	-562.8	2100	UV
HRLT A5-A6 Voltage Plus - 3	0	N/A	73770	73430	-338.5	2100	UV
HRLT A5-A6 Voltage Plus - 4	0	N/A	70830	70600	-228.0	2100	UV
HRLT A5-A6 Voltage Plus - 5	0	N/A	70000	69860	-132.0	2100	UV
HRLT A5-A6 Voltage Plus - 6	0	N/A	-69370	-68910	462.0	2100	UV
HRLT A5-A6 Voltage Plus - 7	0	N/A	70000	70000	0	2100	UV

High Resolution Laterolog Array - B Wellsite Calibration - HRLT VTP

Before: 15-Jan-2012 3:14 After: 15-Jan-2012 7:34

HRLT Torpedo-M0 Voltage - 0	0	N/A	-68390	-68250	140.2	2100	UV
HRLT Torpedo-M0 Voltage - 1	0	N/A	-72920	-72500	419.9	2100	UV
HRLT Torpedo-M0 Voltage - 2	0	N/A	-73090	-72510	584.2	2100	UV
HRLT Torpedo-M0 Voltage - 3	0	N/A	-74070	-73710	355.9	2100	UV
HRLT Torpedo-M0 Voltage - 4	0	N/A	-71030	-70800	232.3	2100	UV
HRLT Torpedo-M0 Voltage - 5	0	N/A	-70170	-70020	145.3	2100	UV
HRLT Torpedo-M0 Voltage - 6	0	N/A	69660	69180	-474.1	2100	UV
HRLT Torpedo-M0 Voltage - 7	0	N/A	-70000	-70000	0	2100	UV

High Resolution Laterolog Array - B Wellsite Calibration - HRLT VBD

Before: 15-Jan-2012 3:14 After: 15-Jan-2012 7:34

HRLT Bridle#9-M0 Voltage - 0	0	N/A	-68380	-68250	125.8	2100	UV
HRLT Bridle#9-M0 Voltage - 1	0	N/A	-72890	-72470	421.6	2100	UV
HRLT Bridle#9-M0 Voltage - 2	0	N/A	-73080	-72490	589.7	2100	UV
HRLT Bridle#9-M0 Voltage - 3	0	N/A	-74050	-73690	355.9	2100	UV
HRLT Bridle#9-M0 Voltage - 4	0	N/A	-71010	-70800	216.4	2100	UV
HRLT Bridle#9-M0 Voltage - 5	0	N/A	-70150	-70020	134.8	2100	UV
HRLT Bridle#9-M0 Voltage - 6	0	N/A	69630	69170	-456.0	2100	UV
HRLT Bridle#9-M0 Voltage - 7	0	N/A	-70000	-70000	0	2100	UV

High Resolution Laterolog Array - B Wellsite Calibration - HRLT ISO

Before: 15-Jan-2012 3:14 After: 15-Jan-2012 7:34

HRLT Source Current Plus - 0	0	N/A	285.1	284.6	-0.5565	8.520	UA
HRLT Source Current Plus - 1	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus - 2	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus - 3	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus - 4	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus - 5	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus - 6	0	N/A	281.1	281.1	0	8.520	UA
HRLT Source Current Plus - 7	0	N/A	281.1	281.1	0	8.520	UA

High Resolution Laterolog Array - B Wellsite Calibration - HRLT MV

Before: 15-Jan-2012 3:14 After: 15-Jan-2012 7:34

HRLT Vertical Voltage PI - 0	0	N/A	-322.1	-321.1	0.9331	9.681	UV
HRLT Vertical Voltage PI - 1	0	N/A	-331.1	-328.9	2.140	9.681	UV
HRLT Vertical Voltage PI - 2	0	N/A	-330.5	-327.5	3.036	9.681	UV
HRLT Vertical Voltage PI - 3	0	N/A	-331.3	-329.4	1.834	9.681	UV
HRLT Vertical Voltage PI - 4	0	N/A	-316.3	-315.1	1.268	9.681	UV
HRLT Vertical Voltage PI - 5	0	N/A	-327.3	-326.4	0.9203	9.681	UV
HRLT Vertical Voltage PI - 6	0	N/A	334.6	332.2	-2.409	9.681	UV
HRLT Vertical Voltage PI - 7	0	N/A	-322.7	-322.7	0	9.681	UV

Hostile Litho-Density Sonde Wellsite Calibration - Background Measurement

Master: 9-Jan-2012 1:31 Before: 9-Jan-2012 5:28 After: 9-Jan-2012 5:41

SS Cs Resolution Bkg	9.000	7.671	7.699	7.674	-0.02595	1.800	%
LS Cs Resolution Bkg	9.000	7.932	7.932	7.903	-0.02832	1.800	%
LSW1 Background	100.0	86.47	87.96	88.18	0.2268	0.03000	CPS
LSW2 Background	100.0	79.53	78.84	77.83	-1.012	0.03000	CPS
LSW3 Background	200.0	181.2	177.4	176.9	-0.4995	0.03000	CPS
LSW4 Background	250.0	222.9	222.9	222.1	-0.8559	0.03000	CPS
LSW5 Background	600.0	520.3	522.4	523.9	1.526	0.03000	CPS
SSW1 Background	100.0	84.85	84.97	85.18	0.2121	0.03000	CPS
SSW2 Background	200.0	146.1	146.8	146.4	-0.3670	0.03000	CPS
SSW3 Background	500.0	411.2	408.9	409.6	0.6414	0.03000	CPS
SSW4 Background	270.0	221.2	219.6	222.1	2.435	0.03000	CPS
SSW5 Background	200.0	157.4	157.7	158.8	1.064	0.03000	CPS

Hostile Litho-Density Sonde Wellsite Calibration - Aluminum Measurement

Master: 9-Jan-2012 1:31

LSW1 Aluminum	600.0	529.4	N/A	N/A	N/A	N/A	CPS
LSW2 Aluminum	900.0	768.5	N/A	N/A	N/A	N/A	CPS

LSW3 Aluminum	1100	932.7	N/A	N/A	N/A	N/A	CPS
LSW4 Aluminum	580.0	473.3	N/A	N/A	N/A	N/A	CPS
LSW5 Aluminum	570.0	425.6	N/A	N/A	N/A	N/A	CPS
SSW1 Aluminum	2800	2541	N/A	N/A	N/A	N/A	CPS
SSW2 Aluminum	8000	6940	N/A	N/A	N/A	N/A	CPS
SSW3 Aluminum	11600	9683	N/A	N/A	N/A	N/A	CPS
SSW4 Aluminum	5000	3909	N/A	N/A	N/A	N/A	CPS
SSW5 Aluminum	660.0	464.7	N/A	N/A	N/A	N/A	CPS

Hostile Litho-Density Sonde Wellsite Calibration – Lithology Measurement

Master: 9-Jan-2012 1:31

LSW1 Iron	400.0	371.1	N/A	N/A	N/A	N/A	CPS
LSW2 Iron	730.0	638.6	N/A	N/A	N/A	N/A	CPS
LSW3 Iron	1000	849.1	N/A	N/A	N/A	N/A	CPS
LSW4 Iron	520.0	442.4	N/A	N/A	N/A	N/A	CPS
LSW5 Iron	470.0	405.0	N/A	N/A	N/A	N/A	CPS
SSW1 Iron	2100	1889	N/A	N/A	N/A	N/A	CPS
SSW2 Iron	6800	5949	N/A	N/A	N/A	N/A	CPS
SSW3 Iron	10800	9074	N/A	N/A	N/A	N/A	CPS
SSW4 Iron	4600	3693	N/A	N/A	N/A	N/A	CPS
SSW5 Iron	580.0	431.1	N/A	N/A	N/A	N/A	CPS

Hostile Litho-Density Sonde Wellsite Calibration – Caliper Calibration

Before: 9-Jan-2012 5:30

HLDS Caliper Small Ring	12.00	N/A	14.30	N/A	N/A	N/A	IN
HLDS Caliper Large Ring	15.19	N/A	18.07	N/A	N/A	N/A	IN

Enhanced DTS Cartridge Wellsite Calibration – EDTC Accelerometer Calibration

Before: 15-Jan-2012 3:14

EDTC Z-Axis Acceleration	9.810	N/A	9.797	N/A	N/A	N/A	M/S2
--------------------------	-------	-----	-------	-----	-----	-----	------

Enhanced DTS Cartridge Wellsite Calibration – Detector Calibration

Before: 27-Dec-2011 9:12 After: Calibration not done

Gamma Ray (Jig – Bkg)	160.1	N/A	160.1	N/A	N/A	0.09091	GAPI
Gamma Ray (Calibrated)	164.0	N/A	164.0	N/A	N/A	15.00	GAPI

Hostile Natural Gamma Ray Cartridge – B / Equipment Identification

Primary Equipment:

HNGC Cartridge HNGC – B 300

Auxiliary Equipment:

HNGC Housing HNGH – A 115

Hostile Natural Gamma Ray Sonde / Equipment Identification

Primary Equipment:

HNGS Sonde HNGS – BA 194

Auxiliary Equipment:

HNGS Sonde Housing HNSH – BA 205  
Gamma Source Radioactive GSR – U 616008

High Resolution Laterolog Array – B / Equipment Identification

Primary Equipment:



HRLT Sonde HRLS – B 969

Auxiliary Equipment:

HRLT lower Housing HRLH – B 759  
HRLT Lower Cartridge HRLC – B 759  
HRLT upper Housing HRLU – B 769  
HRLT Upper Cartridge HRUC – B 769

High Resolution Laterolog Array – B Wellsite Calibration

HRLT M01

Idx	Phase	HRLT M0-M1 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		-319.7	-322.7	-280.7	-379.7
	After		-318.5			



Idx	Phase	Value	Nominal	Maximum	Minimum
1	Before	-318.5	-322.7	-280.7	-379.7
	After	-334.8			
2	Before	-337.1	-322.7	-280.7	-379.7
	After	-334.1			
3	Before	-339.6	-322.7	-280.7	-379.7
	After	-337.5			
4	Before	-327.0	-322.7	-280.7	-379.7
	After	-325.4			
5	Before	-322.6	-322.7	-280.7	-379.7
	After	-321.4			
6	Before	327.3	322.7	379.7	280.7
	After	325.0			
7	Before	-322.7	-322.7	-280.7	-379.7
	After	-322.7			
		(Minimum)	(Nominal)	(Maximum)	

Before: 15-Jan-2012 3:14

After: 15-Jan-2012 7:34

High Resolution Laterolog Array – B Wellsite Calibration						
HRLT M12						
Idx	Phase	HRLT M1–M2 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		1757	1781	2095	1549
	After		1754			
1	Before		1851	1781	2095	1549
	After		1841			
2	Before		1848	1781	2095	1549
	After		1832			
3	Before		1861	1781	2095	1549
	After		1852			
4	Before		1794	1781	2095	1549
	After		1788			
5	Before		1771	1781	2095	1549
	After		1768			
6	Before		-1806	-1781	-1549	-2095
	After		-1794			
7	Before		1781	1781	2095	1549
	After		1781			
		(Minimum)	(Nominal)	(Maximum)		

Before: 15-Jan-2012 3:14

After: 15-Jan-2012 7:34

High Resolution Laterolog Array – B Wellsite Calibration						
HRLT M23						
Idx	Phase	HRLT M2–M3 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		1743	1781	2095	1549
	After		1740			
1	Before		1848	1781	2095	1549
	After		1832			

2	After		1838	1781	2095	1549
	Before		1846			
3	After		1855	1781	2095	1549
	Before		1863			
4	After		1783	1781	2095	1549
	Before		1789			
5	After		1765	1781	2095	1549
	Before		1768			
6	After		-1781	-1781	-1549	-2095
	Before		-1792			
7	After		1781	1781	2095	1549
	Before		1781			
(Minimum)                      (Nominal)                      (Maximum)						
Before: 15-Jan-2012 3:14						
After: 15-Jan-2012 7:34						

High Resolution Laterolog Array – B Wellsite Calibration						
HRLT V34						
Idx	Phase	HRLT A3–A4 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	After		68400	70000	82360	60900
	Before		68530			
1	After		72060	70000	82360	60900
	Before		72470			
2	After		72100	70000	82360	60900
	Before		72660			
3	After		73270	70000	82360	60900
	Before		73620			
4	After		70450	70000	82360	60900
	Before		70660			
5	After		69710	70000	82360	60900
	Before		69840			
6	After		-68830	-70000	-60900	-82360
	Before		-69280			
7	After		70000	70000	82360	60900
	Before		70000			
(Minimum)                      (Nominal)                      (Maximum)						
Before: 15-Jan-2012 3:14						
After: 15-Jan-2012 7:34						

High Resolution Laterolog Array – B Wellsite Calibration						
HRLT V45						
Idx	Phase	HRLT A4–A5 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	After		68680	70000	82360	60900
	Before		68810			
1	After		72450	70000	82360	60900
	Before		72850			
2	After		73030	70000	82360	60900
	Before		73030			

Idx	Phase	HRLT A5-A6 Voltage Plus UV	Value	Nominal	Maximum	Minimum
3	After		72460	70000	82360	60900
	Before		73960			
4	After		70740	70000	82360	60900
	Before		70950			
5	After		69980	70000	82360	60900
	Before		70120			
6	After		-69200	-70000	-60900	-82360
	Before		-69660			
7	After		70000	70000	82360	60900
	Before		70000			
(Minimum) (Nominal) (Maximum)						

Before: 15-Jan-2012 3:14  
After: 15-Jan-2012 7:34

High Resolution Laterolog Array – B Wellsite Calibration						
HRLT V56						
Idx	Phase	HRLT A5-A6 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	After		68590	70000	82360	60900
	Before		68710			
1	After		72180	70000	82360	60900
	Before		72580			
2	After		72220	70000	82360	60900
	Before		72780			
3	After		73430	70000	82360	60900
	Before		73770			
4	After		70600	70000	82360	60900
	Before		70830			
5	After		69860	70000	82360	60900
	Before		70000			
6	After		-68910	-70000	-60900	-82360
	Before		-69370			
7	After		70000	70000	82360	60900
	Before		70000			
(Minimum) (Nominal) (Maximum)						

Before: 15-Jan-2012 3:14  
After: 15-Jan-2012 7:34

High Resolution Laterolog Array – B Wellsite Calibration						
HRLT VTP						
Idx	Phase	HRLT Torpedo-M0 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	After		-68250	-70000	-60900	-82360
	Before		-68390			
1	After		-72500	-70000	-60900	-82360
	Before		-72920			
2	After		-72510	-70000	-60900	-82360
	Before		-73090			
3	After		-74070	-70000	-60900	-82360
	Before		-74070			

	After		-73710			
4	Before		-71030	-70000	-60900	-82360
	After		-70800			
5	Before		-70170	-70000	-60900	-82360
	After		-70020			
6	Before		69660	70000	82360	60900
	After		69180			
7	Before		-70000	-70000	-60900	-82360
	After		-70000			
		(Minimum) (Nominal) (Maximum)				

Before: 15-Jan-2012 3:14

After: 15-Jan-2012 7:34

High Resolution Laterolog Array – B Wellsite Calibration							
HRLT VBD							
Idx	Phase	HRLT Bridle#9-M0 Voltage Plus UV	Value	Nominal	Maximum	Minimum	
0	Before		-68380	-70000	-60900	-82360	
	After		-68250				
1	Before		-72890	-70000	-60900	-82360	
	After		-72470				
2	Before		-73080	-70000	-60900	-82360	
	After		-72490				
3	Before		-74050	-70000	-60900	-82360	
	After		-73690				
4	Before		-71010	-70000	-60900	-82360	
	After		-70800				
5	Before		-70150	-70000	-60900	-82360	
	After		-70020				
6	Before		69630	70000	82360	60900	
	After		69170				
7	Before		-70000	-70000	-60900	-82360	
	After		-70000				
		(Minimum) (Nominal) (Maximum)					

Before: 15-Jan-2012 3:14

After: 15-Jan-2012 7:34

High Resolution Laterolog Array – B Wellsite Calibration							
HRLT ISO							
Idx	Phase	HRLT Source Current Plus UA	Value	Nominal	Maximum	Minimum	
0	Before		285.1	284.0	334.1	247.0	
	After		284.6				
1	Before		281.1	281.1	330.7	244.4	
	After		281.1				
2	Before		281.1	281.1	330.7	244.4	
	After		281.1				
3	Before		281.1	281.1	330.7	244.4	
	After		281.1				
4	Before		281.1	281.1	330.7	244.4	
	After		281.1				

5	After		281.1	281.1	330.7	244.4
	Before		281.1			
6	After		281.1	281.1	330.7	244.4
	Before		281.1			
7	After		281.1	281.1	330.7	244.4
	Before		281.1			
			(Minimum)	(Nominal)	(Maximum)	
Before: 15-Jan-2012 3:14						
After: 15-Jan-2012 7:34						

High Resolution Laterolog Array – B Wellsite Calibration						
HRLT MV						
Idx	Phase	HRLT Vertical Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	After		-322.1	-322.7	-280.7	-379.7
	Before		-321.1			
1	After		-331.1	-322.7	-280.7	-379.7
	Before		-328.9			
2	After		-330.5	-322.7	-280.7	-379.7
	Before		-327.5			
3	After		-331.3	-322.7	-280.7	-379.7
	Before		-329.4			
4	After		-316.3	-322.7	-280.7	-379.7
	Before		-315.1			
5	After		-327.3	-322.7	-280.7	-379.7
	Before		-326.4			
6	After		334.6	322.7	379.7	280.7
	Before		332.2			
7	After		-322.7	-322.7	-280.7	-379.7
	Before		-322.7			
			(Minimum)	(Nominal)	(Maximum)	
Before: 15-Jan-2012 3:14						
After: 15-Jan-2012 7:34						

Hostile Litho-Density Sonde / Equipment Identification

Primary Equipment:

Hostile Litho Density Sonde	HLDS – D	45
Hostile Litho Density High Voltage	HLDV – D	45
Gamma Source Radioactive	GSR – Z	2397

Auxiliary Equipment:

Hostile Litho Density Pad	HLDP – C	45
Hostile Litho Density High Voltage Housi	HEH – H	47

Litho-Density Spectroscopy Cartridge – B / Equipment Identification

Primary Equipment:

LDSC Cartridge	LDSC – B	521
----------------	----------	-----

Auxiliary Equipment:

LDSC Housing	LDSH – A	319
--------------	----------	-----

Enhanced DTS Cartridge / Equipment Identification

Primary Equipment:

EDTC Gamma Ray Detector  
Enhanced DTS Cartridge

EDTG – A/B

8305

EDTC – B

8317

Auxiliary Equipment:

EDTC Housing

EDTH – B

8303

Company: **Lamont Doherty**

**Schlumberger**

Well: **Expedition 339, Site U1391 WI-01B**

Field: **Mediterranean Outflow (Portugal)**

Rig: **JOIDES Resolution**

Ocean: **Atlantic**

High Resolution Laterolog Array  
Log Quality Control Log