Schlumberger

Company: **Lamont Doherty Earth Observatory**

Well: **Expedition 351, Site U1438F**
Field: **IBM Arc Origins**
Rig: **JOIDES Resolution** Ocean: **Pacific**

Rig: JOIDES Resolution
Field: IBM Arc Origins
Location: Latitude: N 27.3836116*
Well: Expedition 351, Site U1438F
Company: Lamont Doherty Earth Observato

Hostile Natural Gamma Sonde (HNGS)
High Resolution Laterolog Array (HRLA)
HLDS/APS Density/Porosity

LOCATION

Latitude: N 27.3836116*
Longitude: E 134.3181633*

Elev.:		
	K.B.	−4711.00 m
	G.L.	0.00 m
	D.F.	−4711.00 m

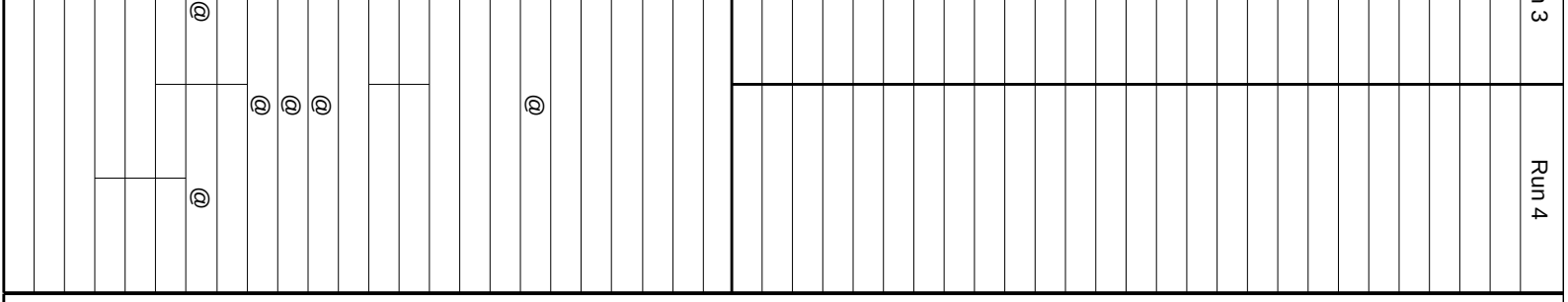
Permanent Datum:	Sea Floor	Elev.:	0.00 m
Log Measured From:	Sea Floor	0.00 m	above Perm. Datum
Drilling Measured From:	Sea Floor		

API Serial No.			
	N 27.3836116	E 134.3181633	

	Run 1	Run 2	Run

Logging Date		25−Jul−2014			
Run Number		1			
Depth Driller		700 m			
Schlumberger Depth		608 m			
Bottom Log Interval		608 m			
Top Log Interval		0 m			
Casing Driller Size @ Depth		5.500 in	@ 94.67 m	@	
Casing Schlumberger		92 m			
Bit Size		9.875 in			
Type Fluid In Hole		Seawater			
MUD Density	Viscosity	1.03 g/cm3			
Fluid Loss	PH				
Source Of Sample		N/A			
RM @ Measured Temperature		@		@	
RMF @ Measured Temperature		@		@	
RMC @ Measured Temperature		@		@	
Source RMF	RMC	N/A	N/A		
RM @ MRT	RMF @ MRT	@ 23	@ 23	@	@
Maximum Recorded Temperatures		23 degC			
Circulation Stopped	Time	25−Jul−2014	14:00		
Logger On Bottom	Time	25−Jul−2014	14:00		
Unit Number	Location	627314	Houston		
Recorded By		K. Swain			
Witnessed By		L. Drab			

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			
MUD Density	Viscosity		
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	Location		
Recorded By			
Witnessed By			



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OTHER SERVICES1	OTHER SERVICES2
OS1: FMS/DSI	OS1:
OS2:	OS2:
OS3: MSS	OS3:
OS4:	OS4:
OS5:	OS5:

REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
Hole drilled with RCB rotary cone bit and bottom hole assembly (BHA). 9 7/8 " BS	
Dedicated hole only for logging, no core taken.	
Drill pipe set at 95 mbsf and wireline operation made inside of drillpipe into	
open hole below this depth.	
Lower part of toolstring (MSS and HRLA) centralized using modified MCD inline centralizers.	
Upper part of toolstring (HLDS, HNGS) eccentered using HLDS caliper, as per toolsketch.	
Fluid type was sea water, as used to drill, so no barite corrections were required.	
All logs presented in measured depth below sea floor (MDBSF).	
Maximum observed temperature on the HRLA temperature was 22.6 degC.	
Original log data acquired with drill floor as the reference but later	
played back to sea floor depth as the primary depth reference.	

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

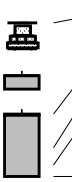
SURFACE EQUIPMENT

SFT−281 1
SFT−178 1
GSR−U 616008
WITM (EDTS)−A 1

DOWNHOLE EQUIPMENT

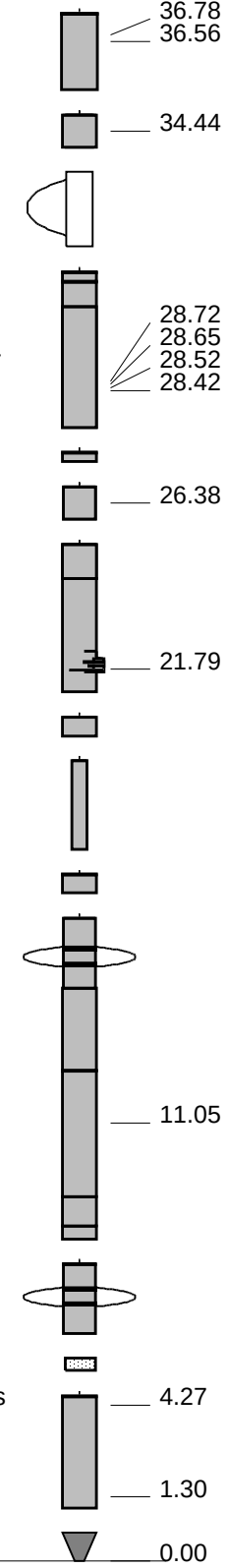
BSP
LEH−QT
AH−369
EDTC−B
EDTH−B 8303
EDTC−B 8317

SP SPARC
MDSB_EDTC
Mud Tempe
CTEM
Gamma Ray
EFTB DIAG
TelStatus
EDTCB Ele



40.78
40.78
39.89
39.46

RUN 2



HNGS−BA 37.48
HNGS−BA 194
HNSH−BA 205

HNGC−B 34.98

ILE−F 33.91
ILE−F 1

AH−191 31.47

APS−C 31.17
APH−AC 121
APS−C 212
MNTR−F 6504

AH−190 27.22

LDSC−B 26.92

HLDS 25.85
GSR−Z 8113
HLDV−D 45
HLDS−D 45
HEH−H 47
HLDP−C 45

AH−184_NonMagKnuckleJoint 21.03

AH−NonMagSpacer 20.42
AH−NonMagSpacer 5714

AH−184_NonMagKnuckleJoint 17.53

AH−MCD2 16.92
AH−MCD2 82

HRLT−B 14.64
HRUH−B 978
HRUC−B 764
HRLS−B 768
HRLH−B 968
HRLC−B 974
AH−270 1708

AH−MCD1 7.26
AH−MCD1 1663

AH−230 4.98

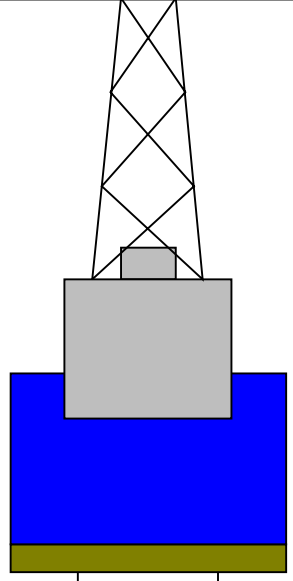
MSS_LDEO−A 4.58
ELIC−A 1
MSS_LDEO−A 1

BNS−NG 0.91

TOOL ZERO

MAXIMUM STRING DIAMETER 3.75 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN METERS

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



Kelly Bushing Elevation −4711

Derrick Floor Elevation −4711

Mean Sea Level −4700

4.1

Sea Floor 0 4.1

Drill Pipe 94.67

Open Hole 9.875

Total Depth 700

Input DLIS Files

DEFAULT	MSS_LDEO_HRLA_LDL_019PUP	FN:30	PRODUCER	25−Jul−2014 17:37	5415.5 M	4700.0 M

Output DLIS Files

DEFAULT	MSS_LDEO_HRLA_LDL_020PUP	FN:32	PRODUCER	25−Jul−2014 17:42	704.5 M	−11.0 M
BACKUP	MSS_LDEO_HRLA_LDL_020PUP	FN:33	PRODUCER	25−Jul−2014 17:42	704.5 M	−11.0 M

OP System Version: 19C0−187

MSS_LDEO−A	19C0−187	HRLT−B	19C0−187
HLDS	19C0−187	LDSC−B	19C0−187
APS−C	19C0−187	HNGC−B	19C0−187
HNGS−BA	19C0−187	EDTC−B	SKK−5169−EDTCB
BSP	19C0−187		

PIP SUMMARY

Time Mark Every 60 S

Sea Floor Depth Reference

Main Log

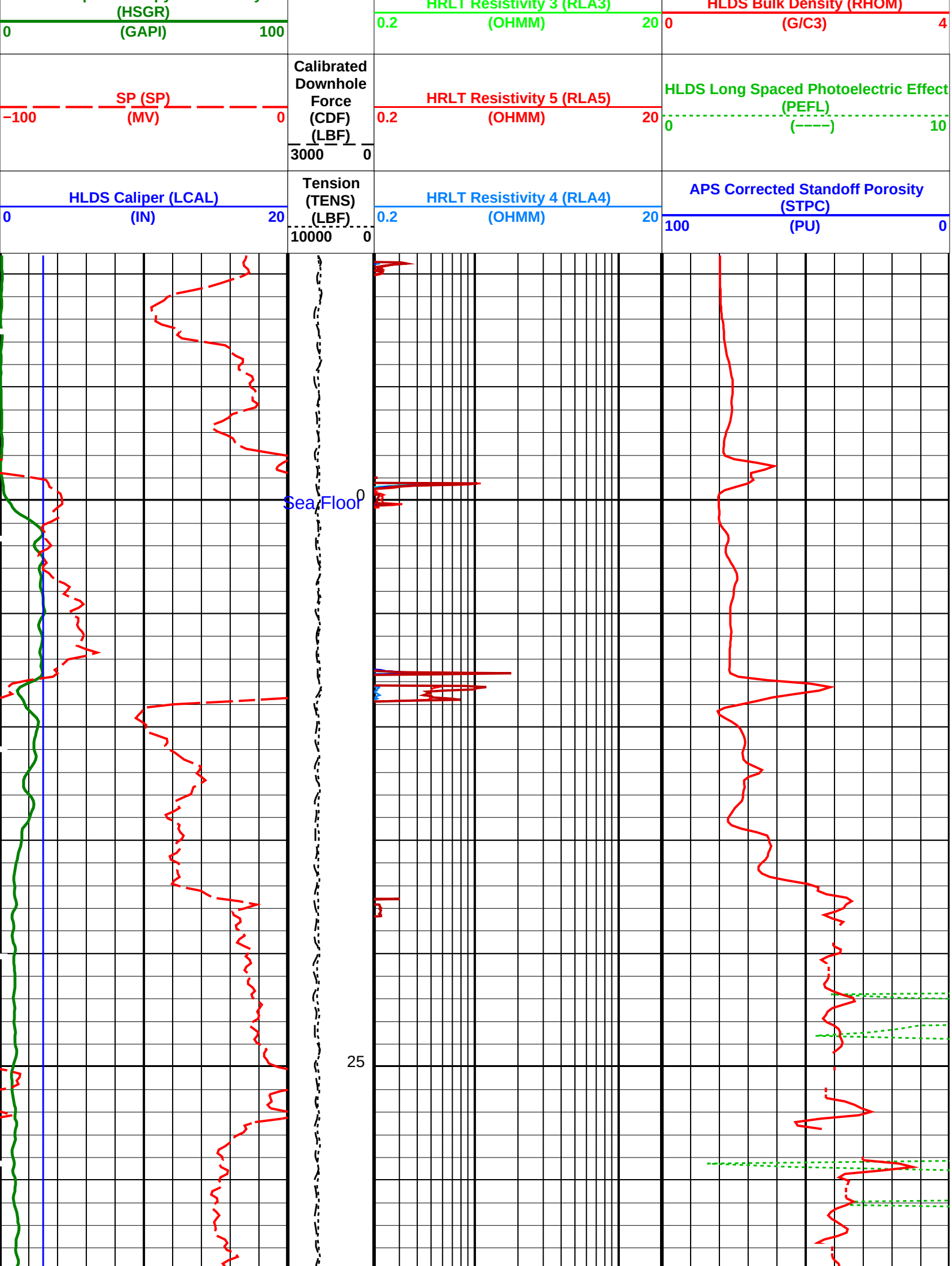
HNGS Spectroscopy Gamma Ray

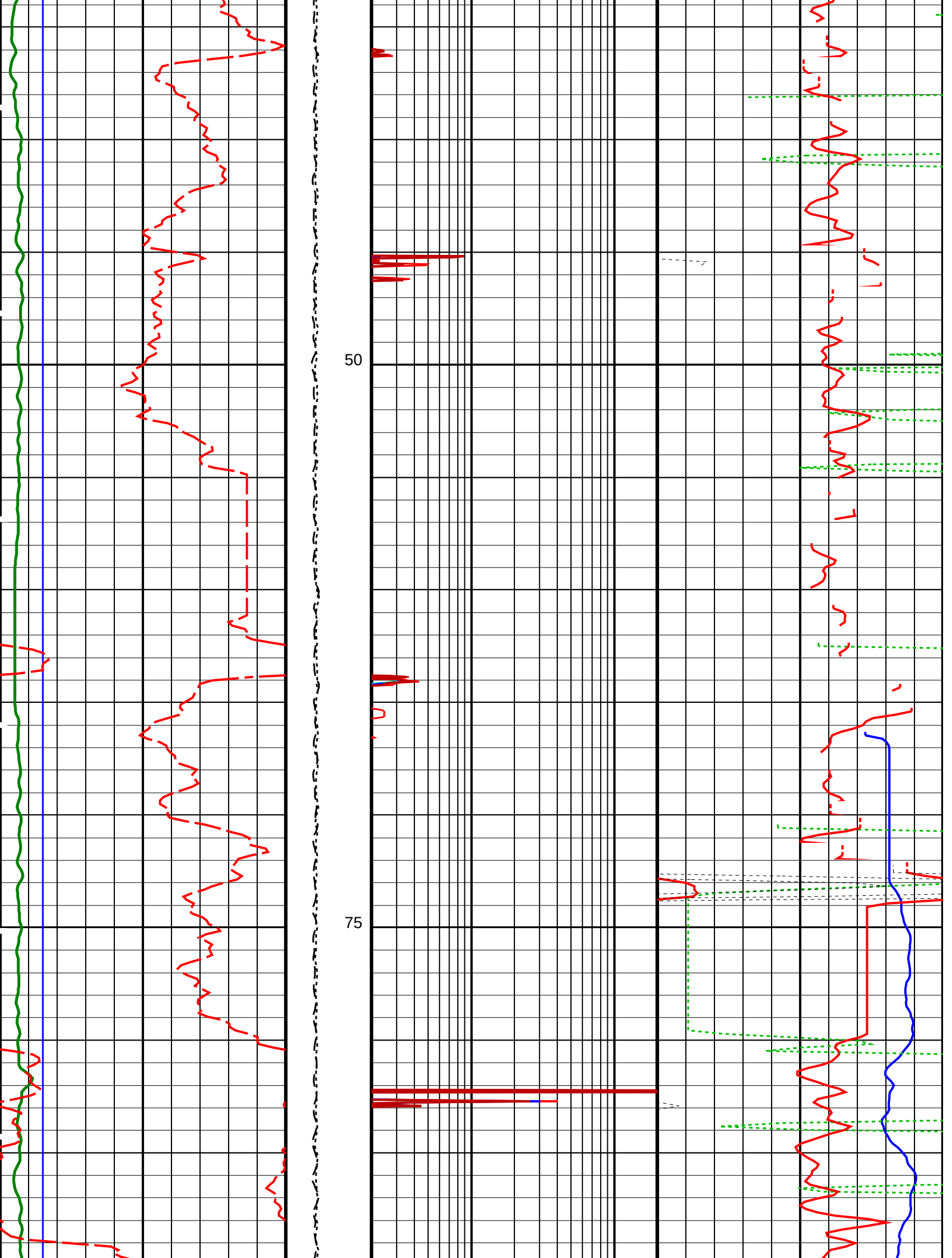
HRLT True Resistivity (RT_HRLT)
0.2 (OHMM) 20

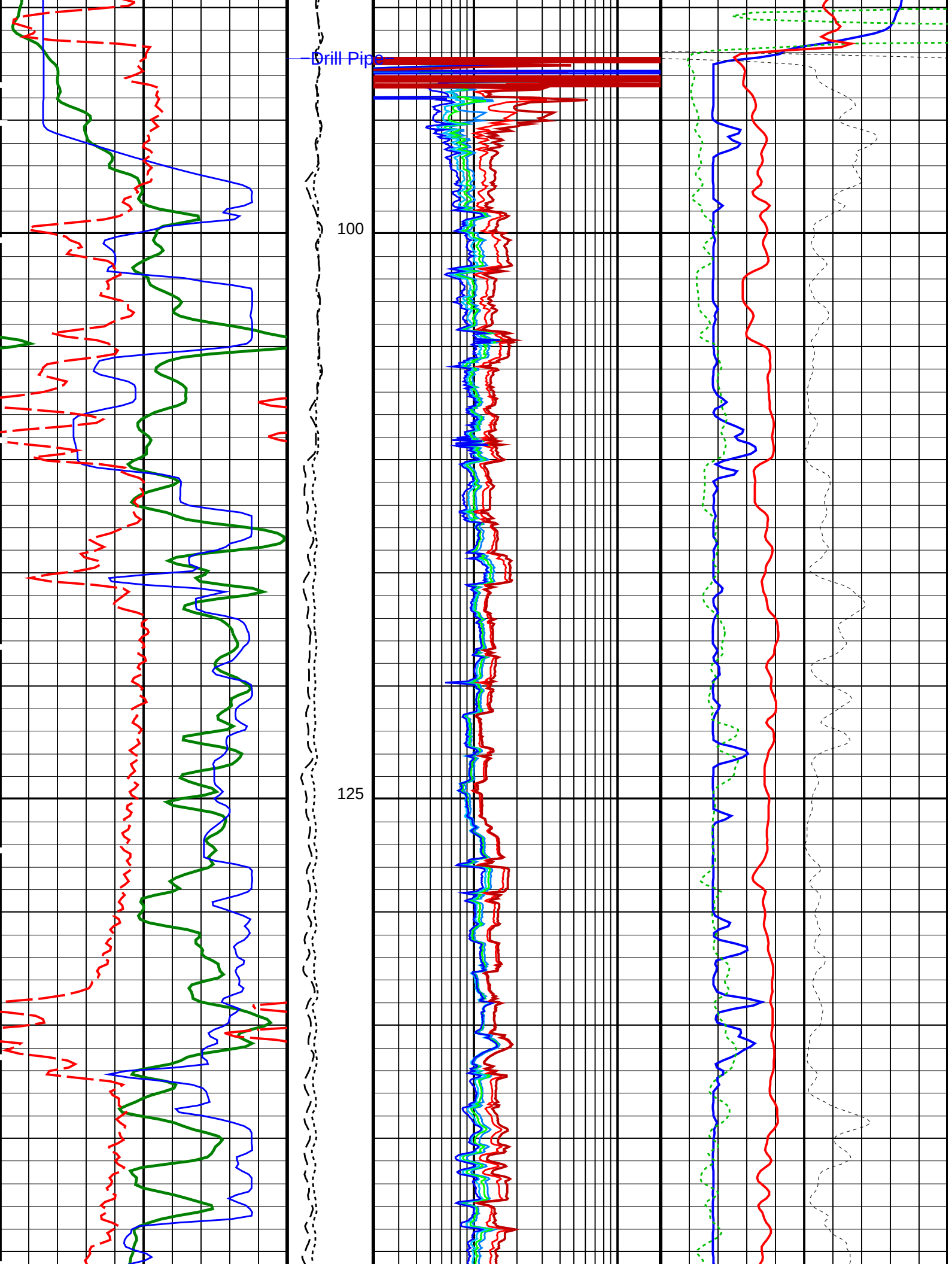
HRLT Resistivity 1 (RLA1)
0.2 (OHMM) 20

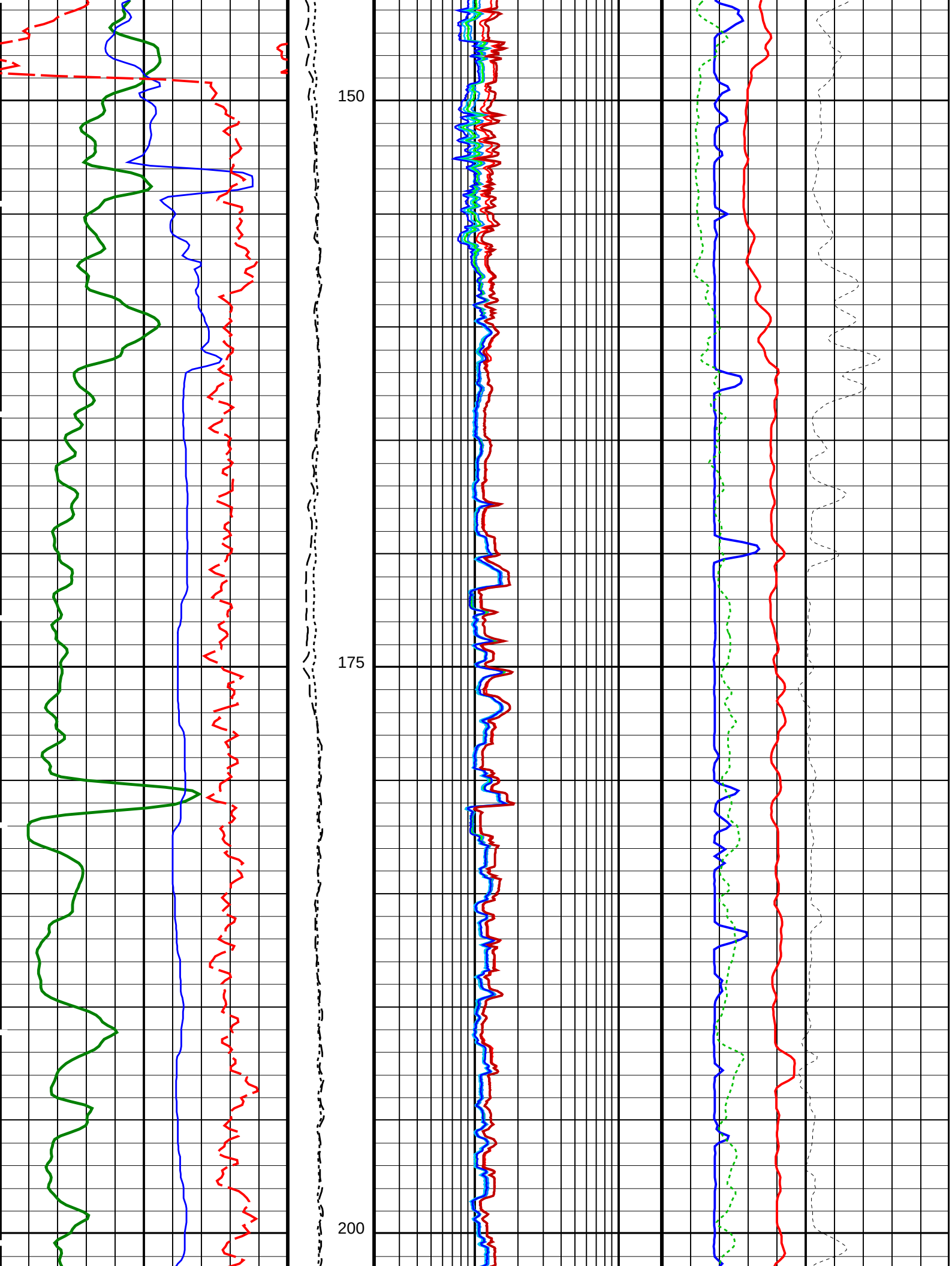
HRLT Resistivity 2 (RLA2)
0.2 (OHMM) 20

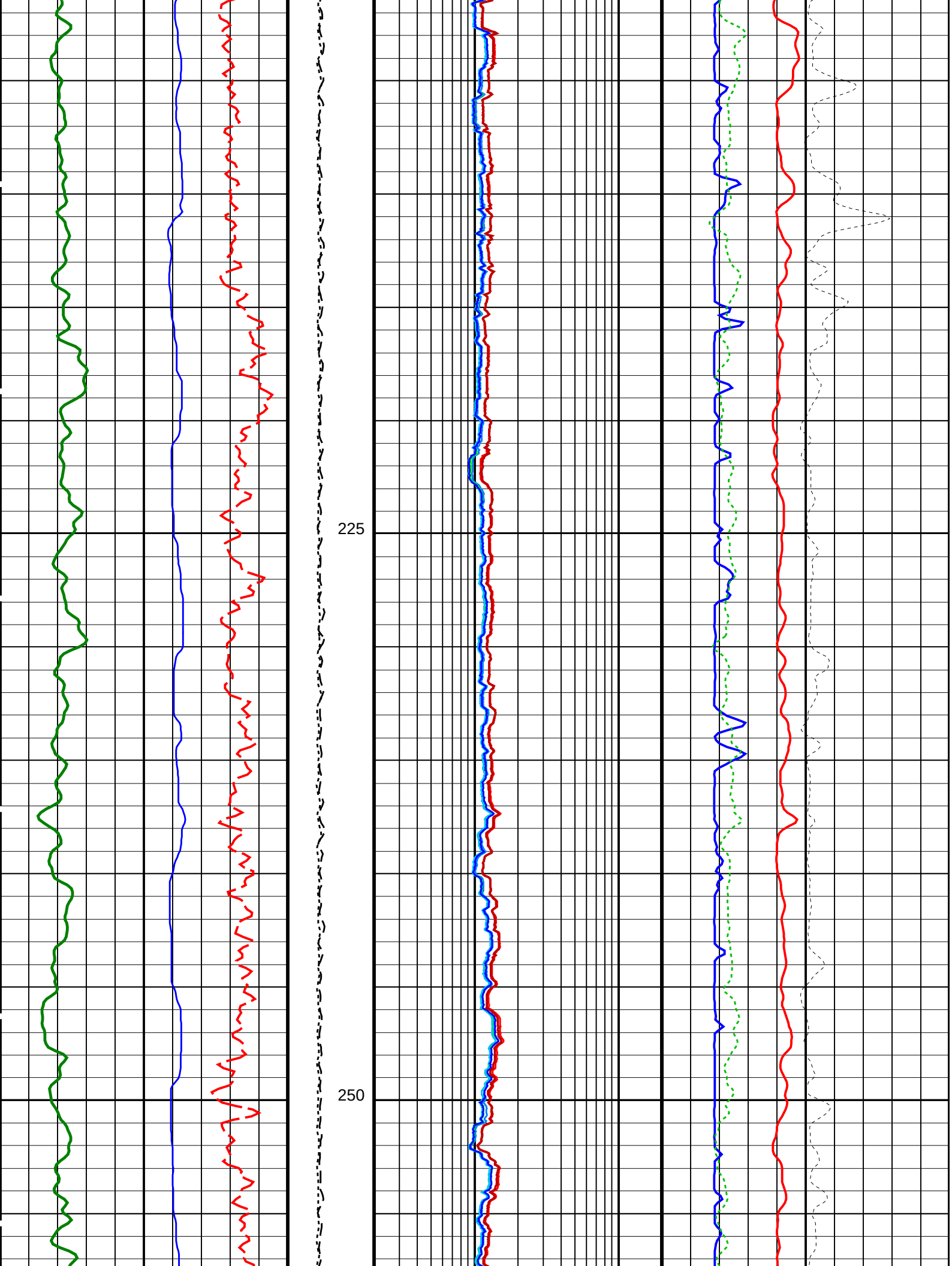
HLDS Bulk Density Correction (DRH)
−0.25 (G/C3) 0.25

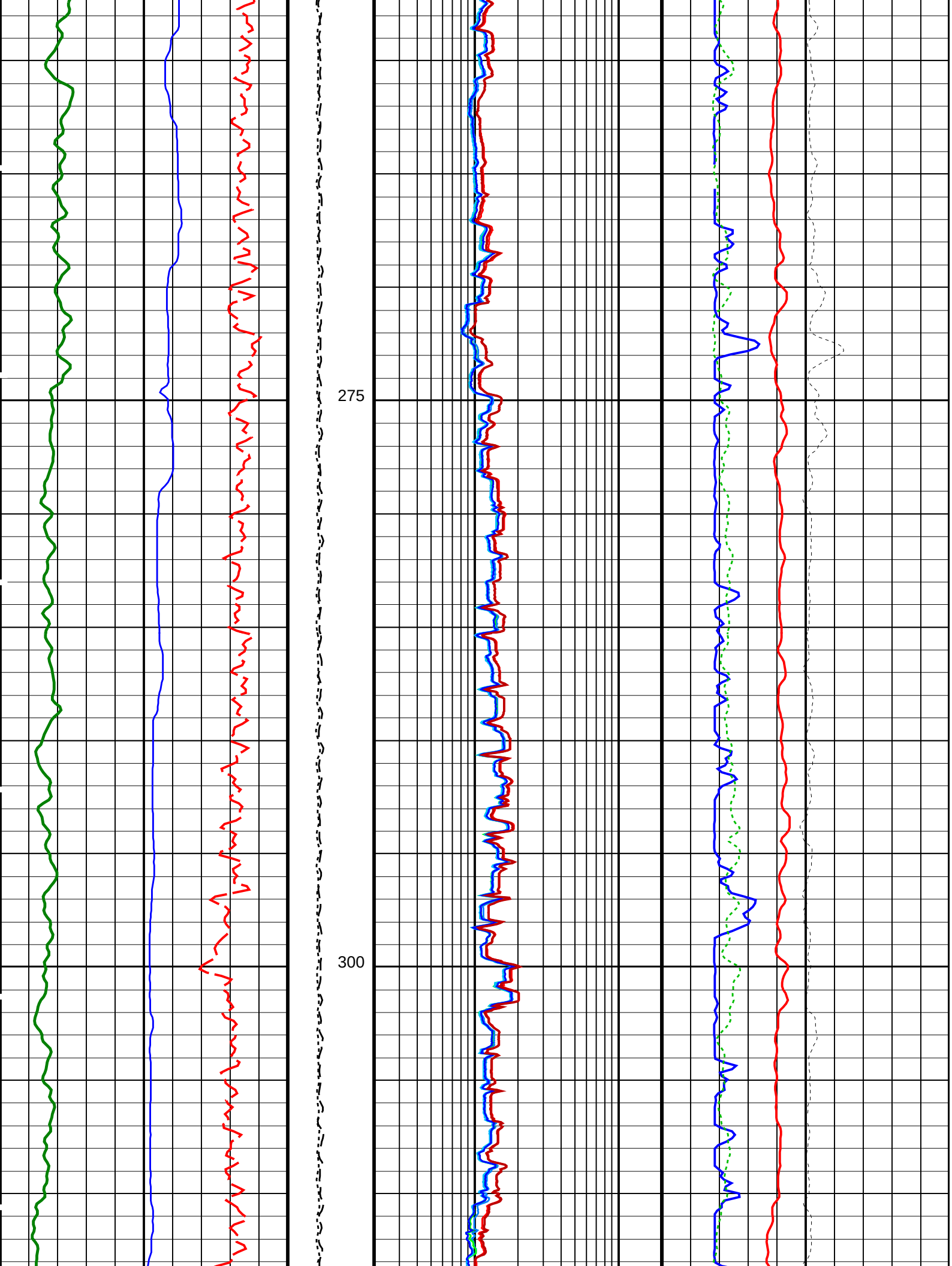

(HSGR)
0
(GAPI)
100
HRLT Resistivity 3 (RLA3)
0.2
(OHMM)
20
HLDS Bulk Density (RHOM)
0
(G/C3)
4
SP (SP)
−100
(MV)
0
Calibrated Downhole Force (CDF) (LBF)
3000
0
HRLT Resistivity 5 (RLA5)
0.2
(OHMM)
20
HLDS Long Spaced Photoelectric Effect (PEFL)
0
(−−−−)
10
HLDS Caliper (LCAL)
0
(IN)
20
Tension (TENS) (LBF)
10000
0
HRLT Resistivity 4 (RLA4)
0.2
(OHMM)
20
APS Corrected Standoff Porosity (STPC)
100
(PU)
0
Sea Floor
0
25

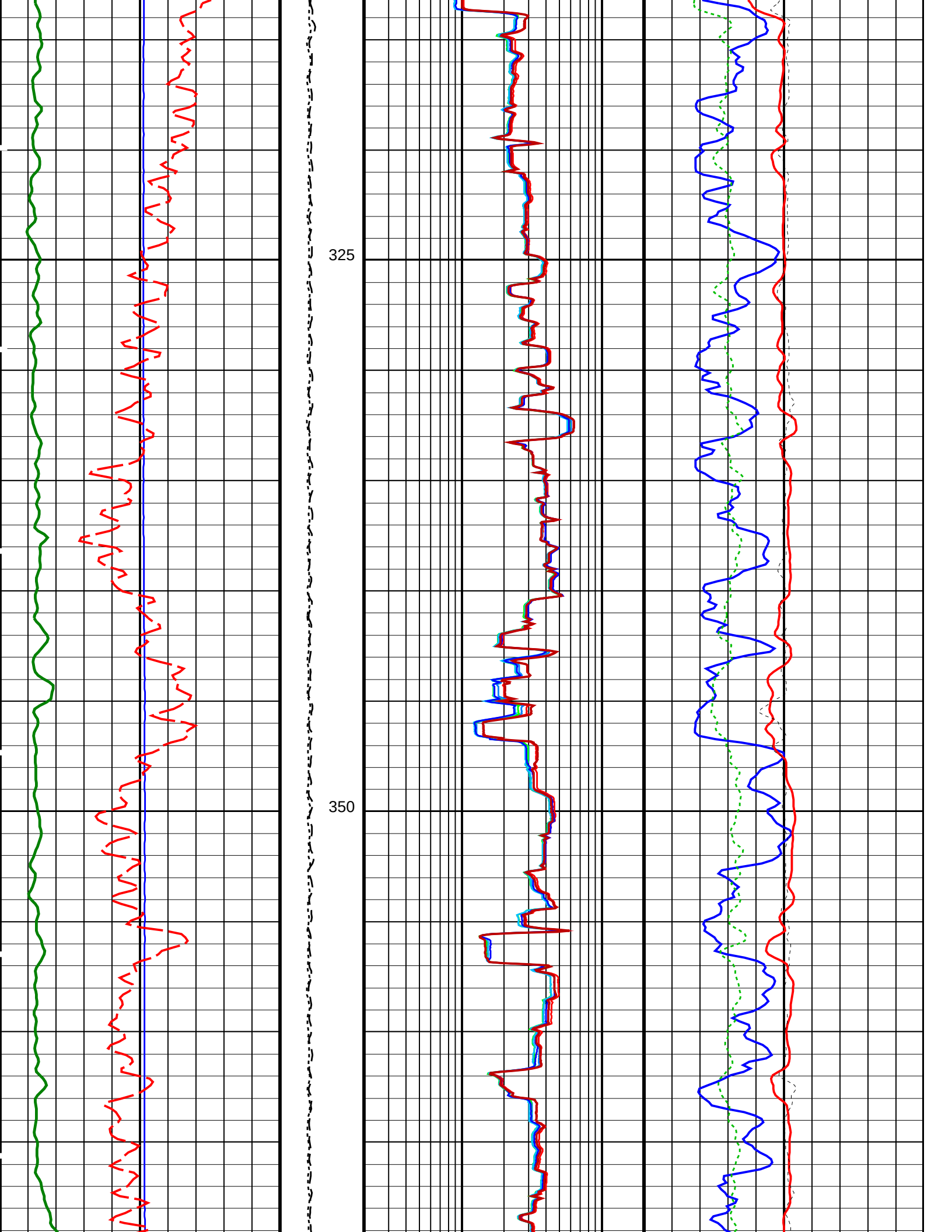

50
75

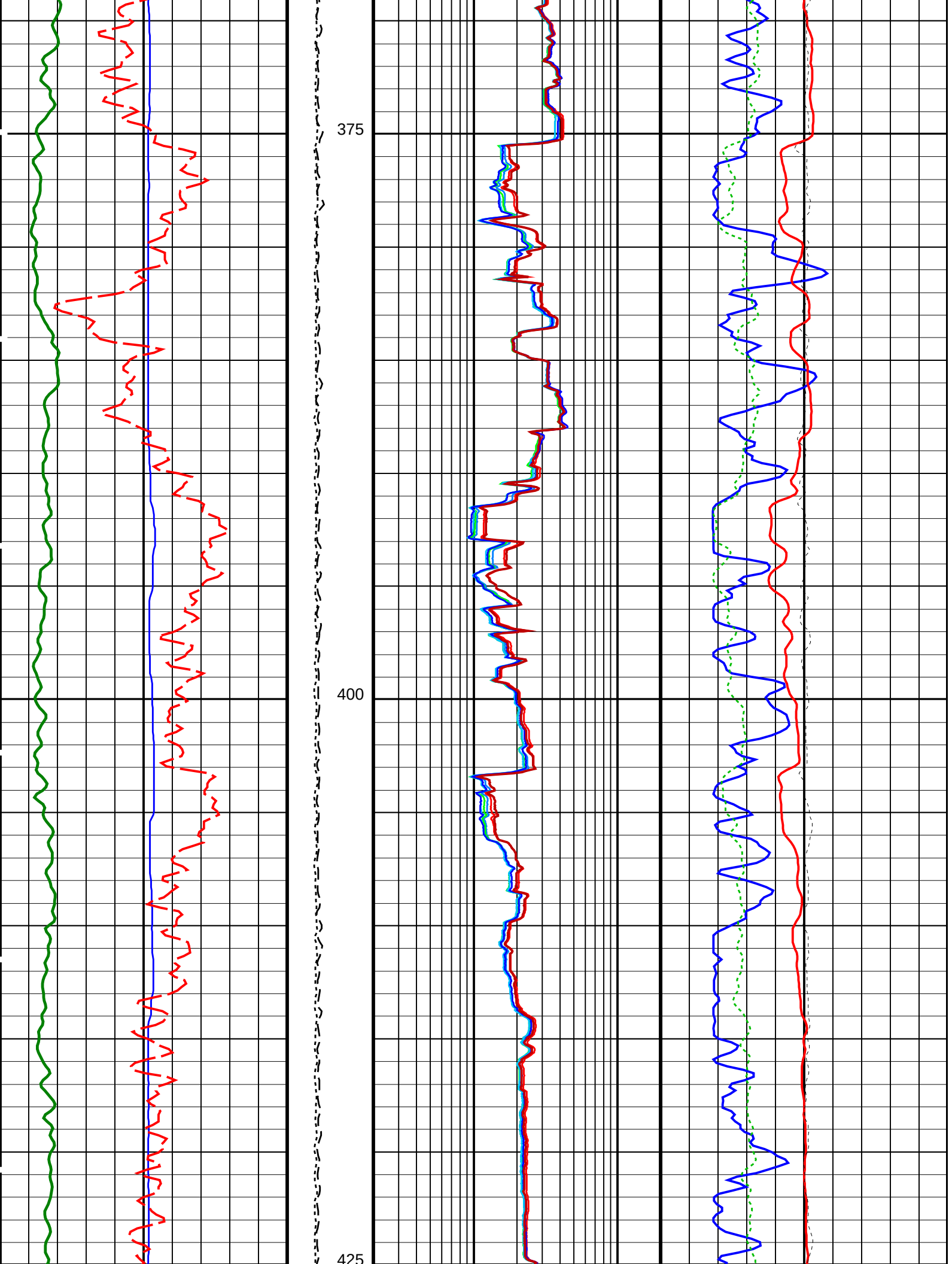

Drill Pipe
100
125

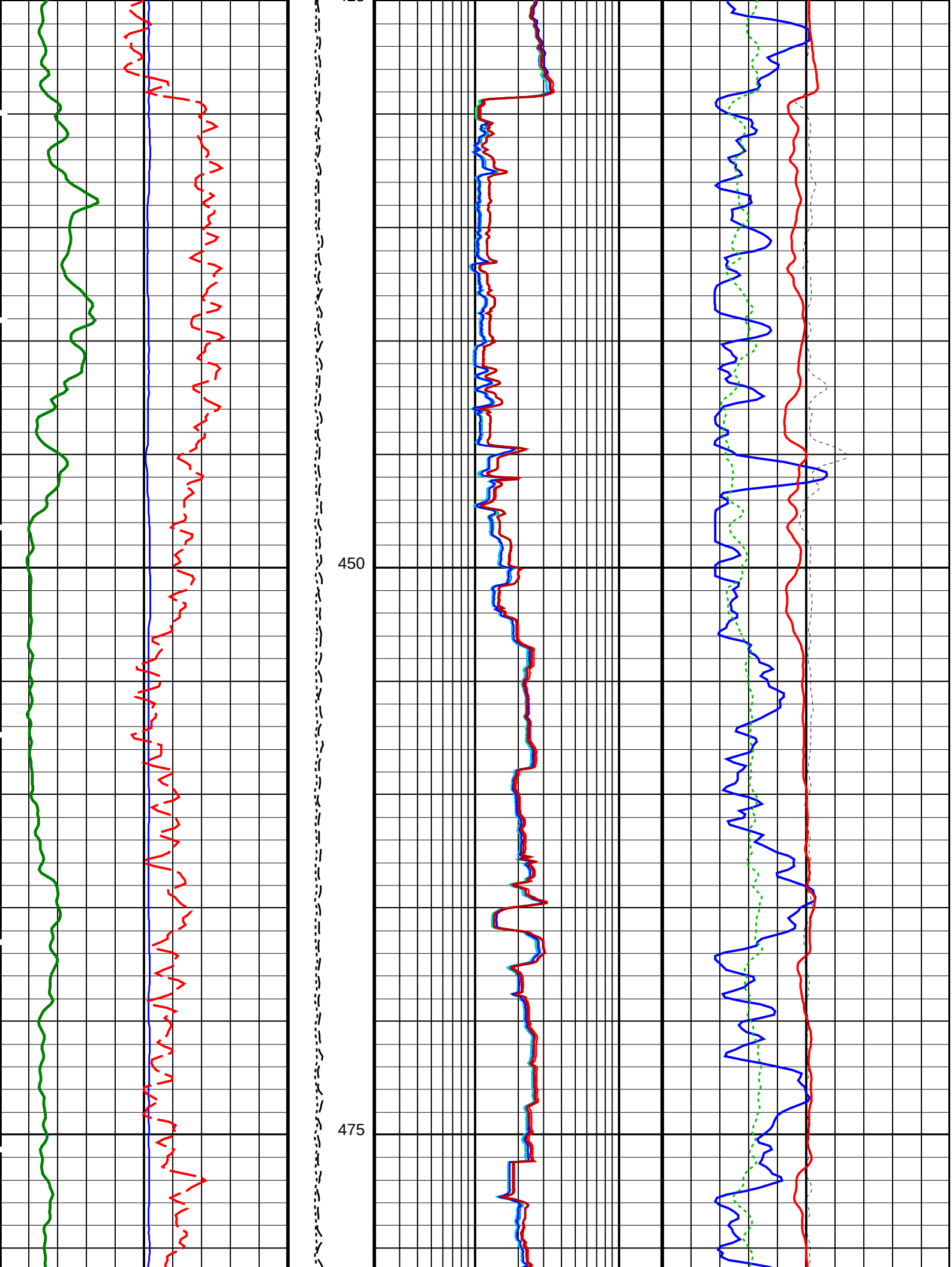

150
175
200

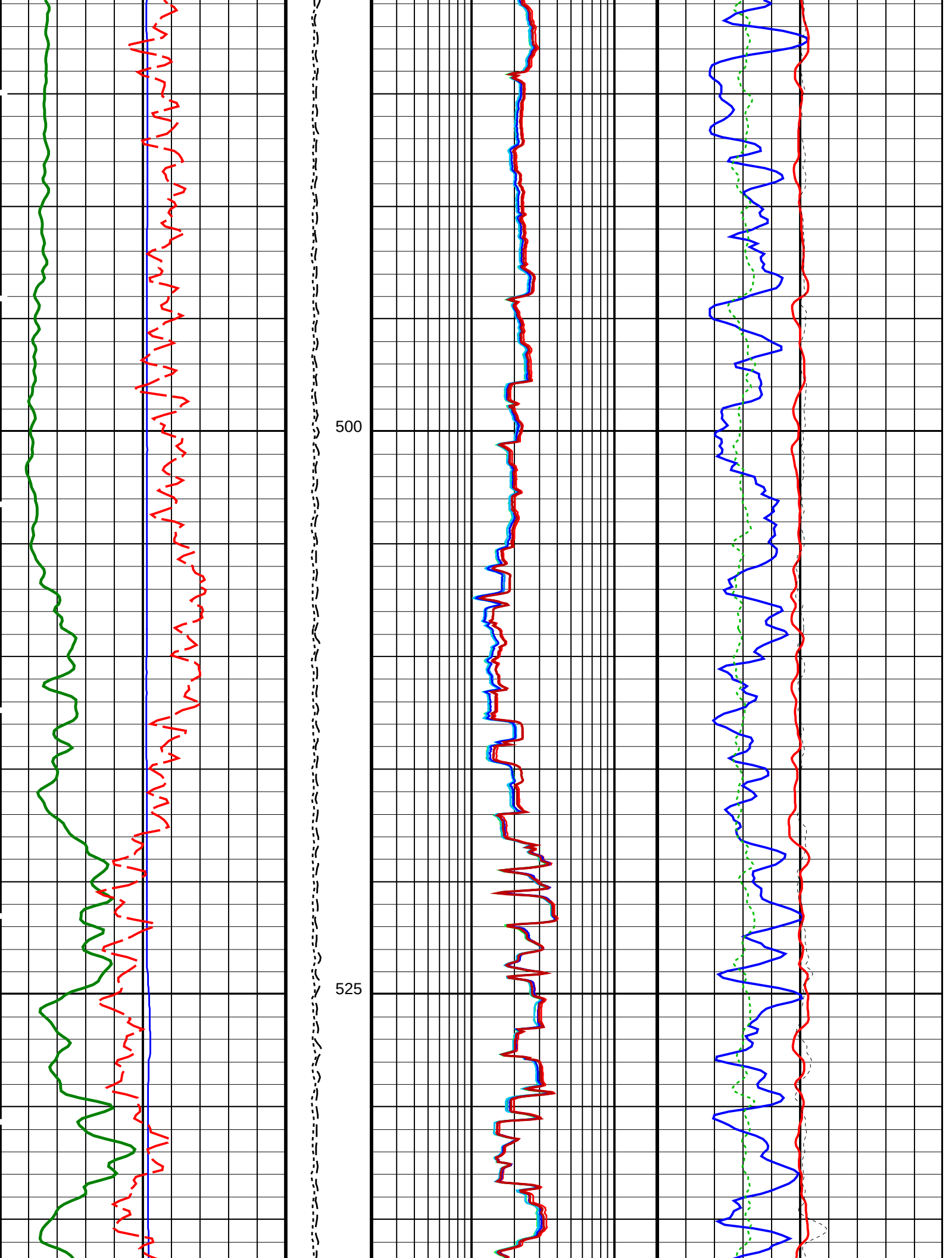

225
250

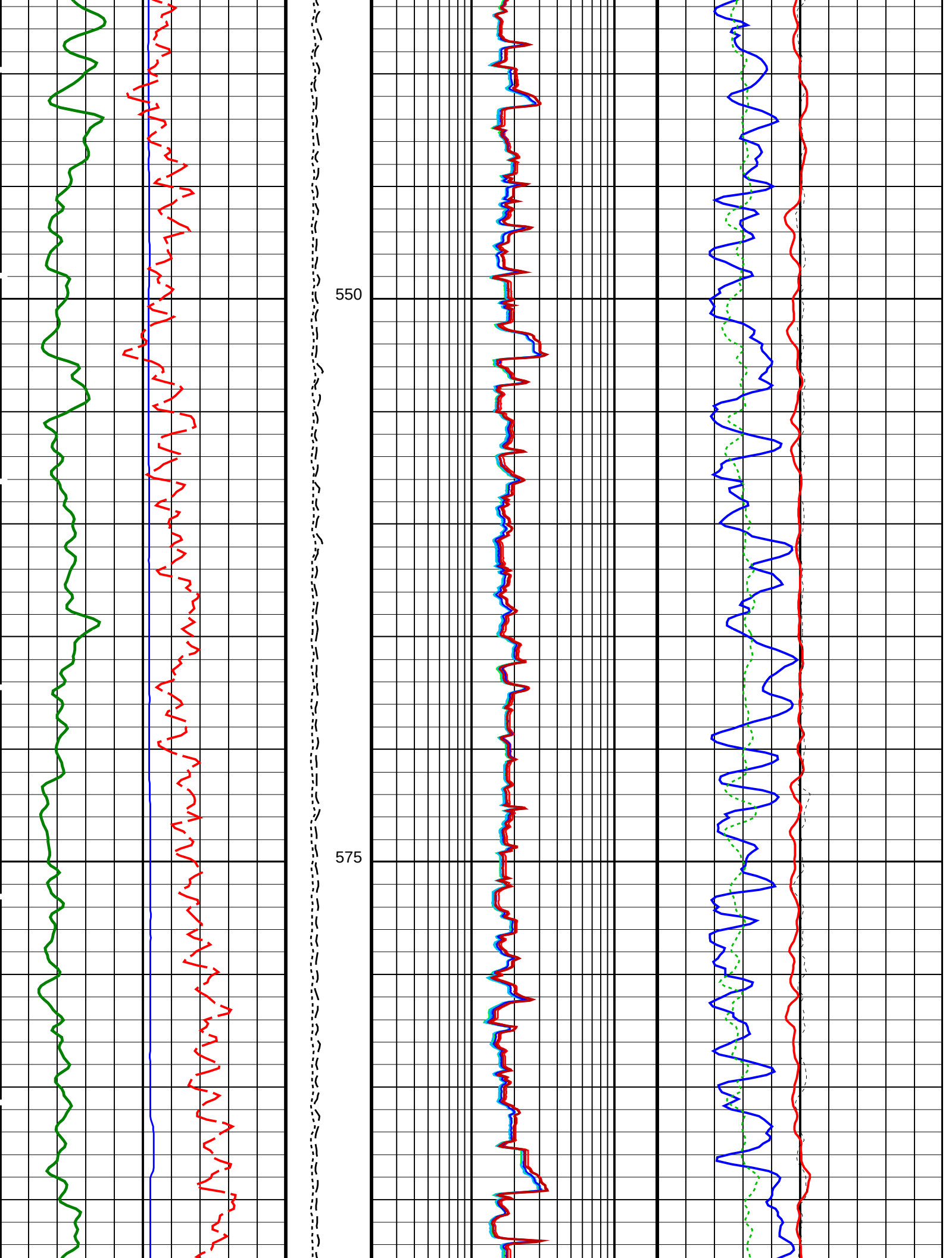

275
300

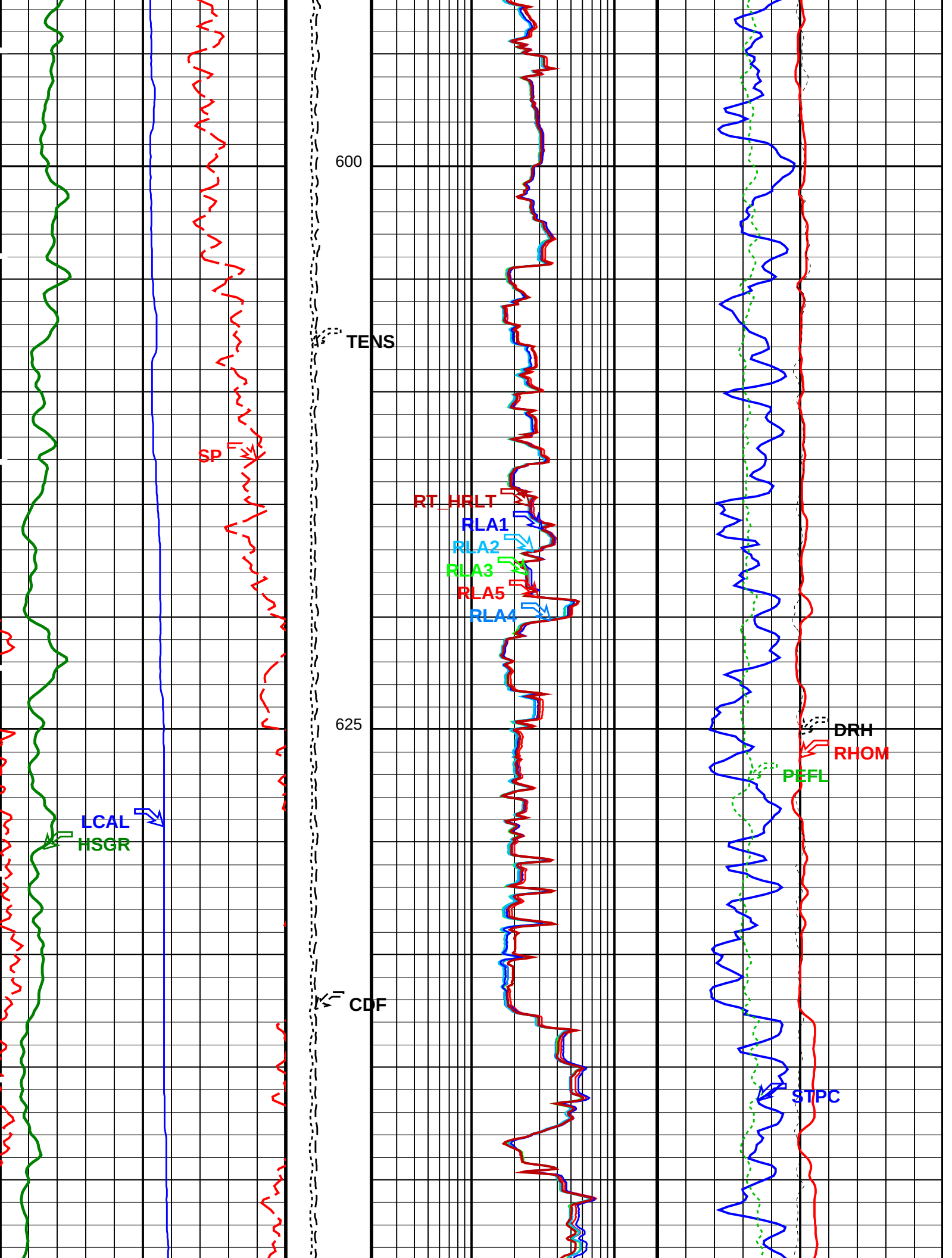

325
350

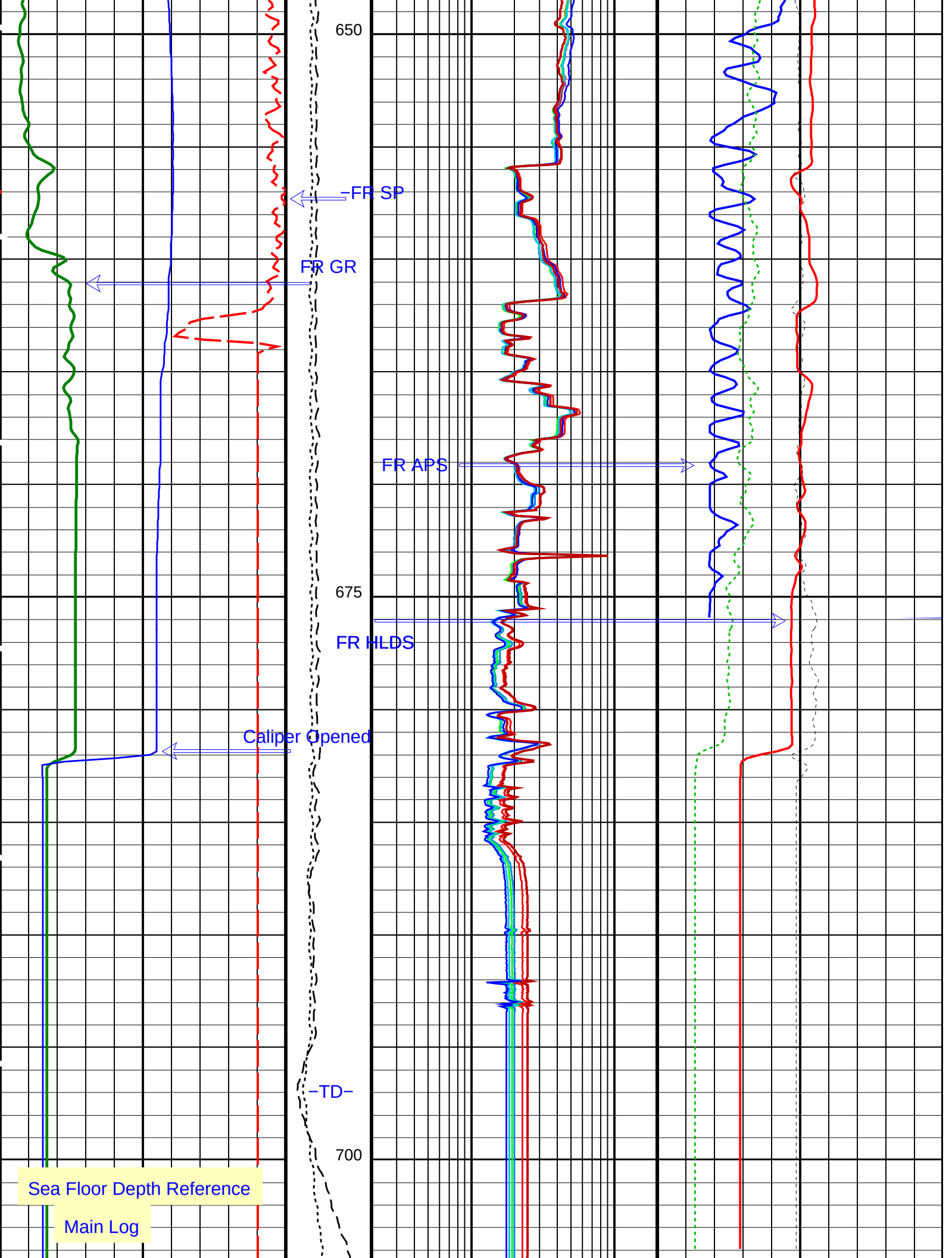

375
400
425

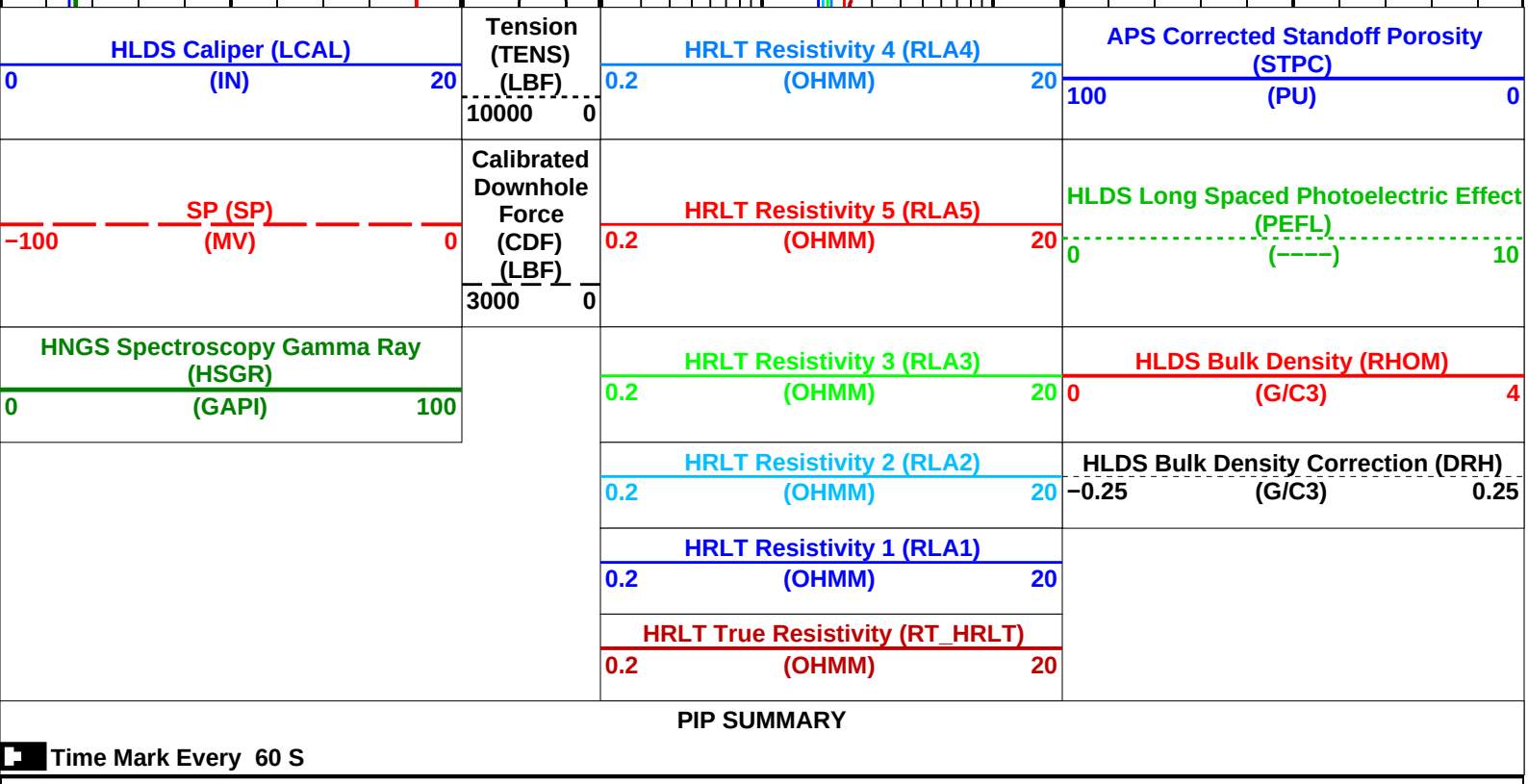

450
475


500
525


550
575


600
TENS
SP
RT_HRLT
RLA1
RLA2
RLA3
RLA5
RLA4
625
DRH
RHOM
PEFL
LCAL
HSGR
CDF
STPC


650
FR SP
FR GR
FR APS
675
FR HLDS
Caliper Opened
TD
700
Sea Floor Depth Reference
Main Log



Parameters

DLIS Name	Description	Value	
	HRLT−B: High Resolution Laterolog Array − B		
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	30	DEGC
CALSTAT	HRLTB Calibration Status	SHALLOW_DONE	
CALTEMP	HRLTB Calibration Temperature	13.133	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	0.018227	DC/M
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	
PROCMSO	Mechanical Standoff Fin Size	0	IN
PROCRM	Processing Mud Resistivity Select	HRLT_Compute	
PROCSPO	Sonde Position	Centered	
SHT	Surface Hole Temperature	35	DEGC
	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	ON	
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	
APS−C: Accelerator−Porosity Tool			
	APS Software Version	0	
AASD	APS Thermal and Array Detectors High Voltage Setting	1939.6	V
ADSO	APS Array Detectors Data Source Switch	Both	
AFSD	APS Far Detector High Voltage Setting	2035.3	V
AHCS	APS Holesize Correction Source	BS	
AHSS	APS Holesize Correction Switch	ON	
AMTY	APS Environmental Corrections Mud Type	WaterBaseBarite	
ANSD	APS Near Detector High Voltage Setting	1695.91	V
ASOS	APS Standoff Correction Switch	ON	
ATSS	APS Temperature−Pressure−Salinity Correction Switch	OFF	
BHFL_APS	APS TNPH Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	30	DEGC
BSCO_APS	APS TNPH Borehole Salinity Correction Option	NO	
DPPM	Density Porosity Processing Mode	HIRS	
DSCO_APS	APS TNPH Density Source Correction Option	MEASURED	
FSAL	Formation Salinity	−50000	PPM
FSCO_APS	APS TNPH Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	LCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCO_APS	APS TNPH Hole Size Correction Option	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MCCO_APS	APS TNPH Mud Cake Correction Option	NO	
MCOR_APS	APS TNPH Mud Correction	NATU	
MWCO_APS	APS TNPH Mud Weight Correction Option	NO	
NARC	APS Near/Array Calibration Ratio	1.08307	
NFRC	APS Near/Far Calibration Ratio	0.974536	
PTCO_APS	APS TNPH Pressure/Temperature Correction Option	NO	
SHT	Surface Hole Temperature	35	DEGC
TNCO_APS	APS TNPH Computation Option	YES	
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)	30	DEGC
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	0.018227	DC/M
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	−0.0015838	
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	35	DEGC
TPOS	Tool Position	CENT	
VBA1	HNGS Detector 1 Variable Barite Factor Running Average	1.02794	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	1.01954	
EDTC−B: Enhanced DTS Cartridge			
BHFL	Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	30	DEGC
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	0.018227	DC/M
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	NO	
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	35	DEGC
SOCN	Standoff Distance	0.5	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	
BSP: Bridle SP			
SPNV	SP Next Value	−10	MV
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	5.500	IN
CWEI	Casing Weight	168.00	LB/F
DFD	Drilling Fluid Density	1.03	G/C3
DO	Depth Offset for Playback	−4711.0	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	700	M
TDD	Total Depth − Driller	700.00	M
TDL	Total Depth − Logger	700.00	M
TWS	Temperature of Connate Water Sample	37.78	DEGC

Format: TripleCombo Vertical Scale: 1:200 Graphics File Created: 25−Jul−2014 17:42

OP System Version: 19C0−187

MSS_LDEO−A	19C0−187	HRLT−B	19C0−187
HLDS	19C0−187	LDSC−B	19C0−187
APS−C	19C0−187	HNGC−B	19C0−187
HNGS−BA	19C0−187	EDTC−B	SKK−5169−EDTCB
BSP	19C0−187		

Input DLIS Files

DEFAULT	MSS_LDEO_HRLA_LDL_019PUP	FN:30	PRODUCER	25−Jul−2014 17:37	5415.5 M	4700.0 M

Output DLIS Files

DEFAULT	MSS_LDEO_HRLA_LDL_020PUP	FN:32	PRODUCER	25−Jul−2014 17:42		
BACKUP	MSS_LDEO_HRLA_LDL_020PUP	FN:33	PRODUCER	25−Jul−2014 17:42		

Input DLIS Files

DEFAULT	MSS_LDEO_HRLA_LDL_014PUP	FN:21	PRODUCER	25−Jul−2014 16:41	5412.2 M	4663.1 M

Output DLIS Files

DEFAULT	MSS_LDEO_HRLA_LDL_017PUP	FN:26	PRODUCER	25−Jul−2014 17:31	701.8 M	−47.9 M
BACKUP	MSS_LDEO_HRLA_LDL_017PUP	FN:27	PRODUCER	25−Jul−2014 17:31	701.8 M	−47.9 M

OP System Version: 19C0−187

MSS_LDEO−A	19C0−187	HRLT−B	19C0−187
HLDS	19C0−187	LDSC−B	19C0−187
APS−C	19C0−187	HNGC−B	19C0−187
HNGS−BA	19C0−187	EDTC−B	SKK−5169−EDTCB

HNGS_BA	19C0-187
BSP	19C0-187

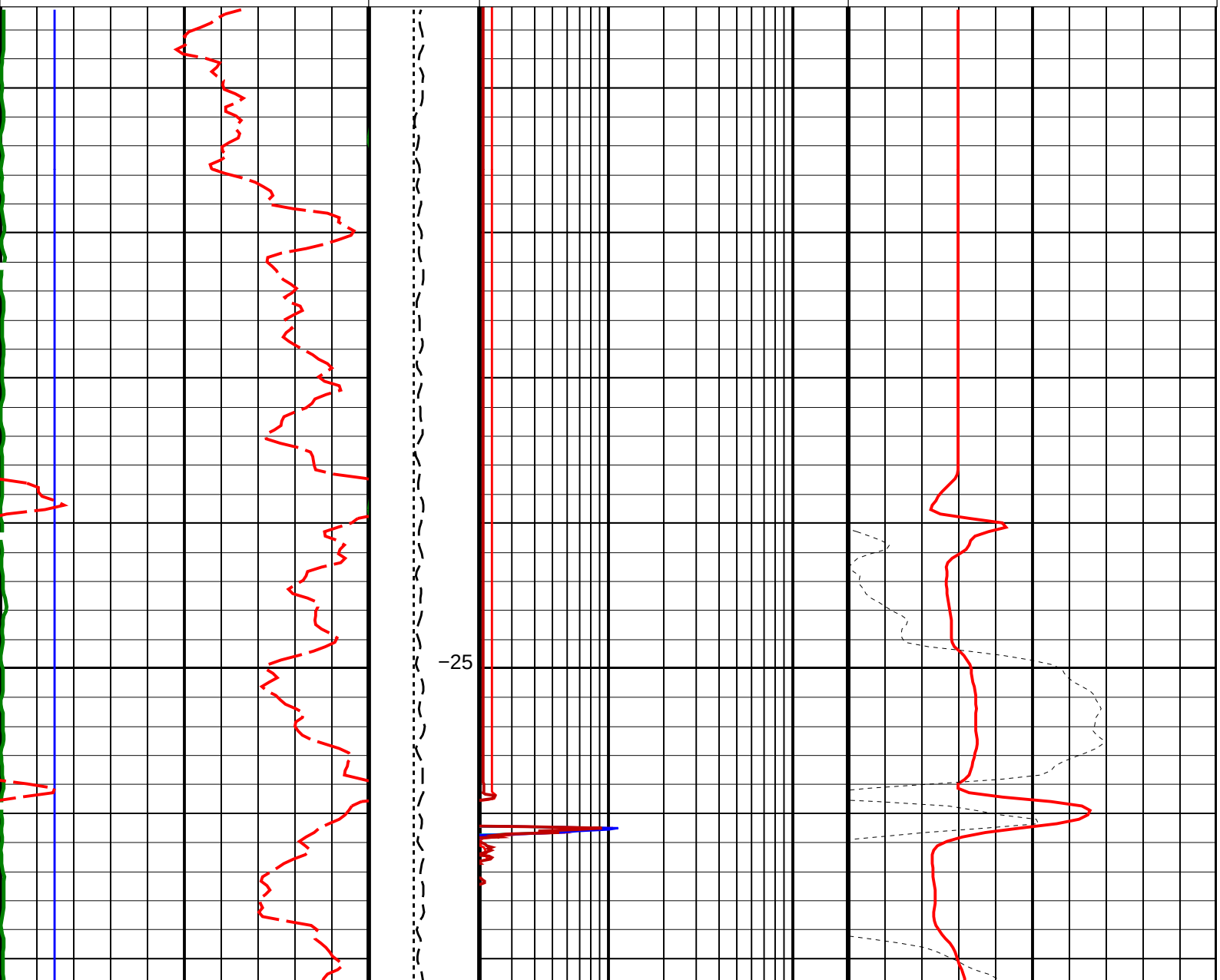
PIP SUMMARY

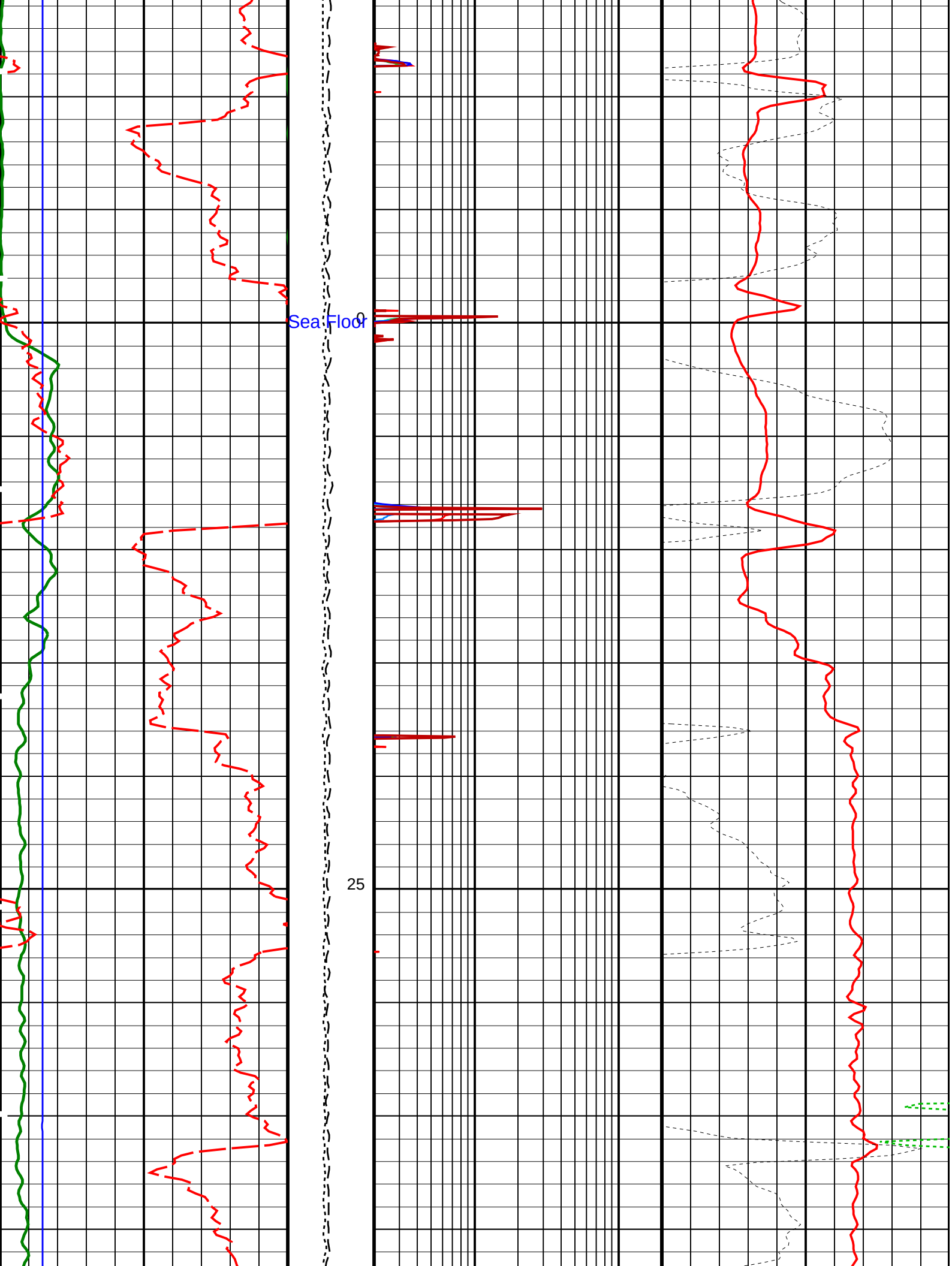
Time Mark Every 60 S

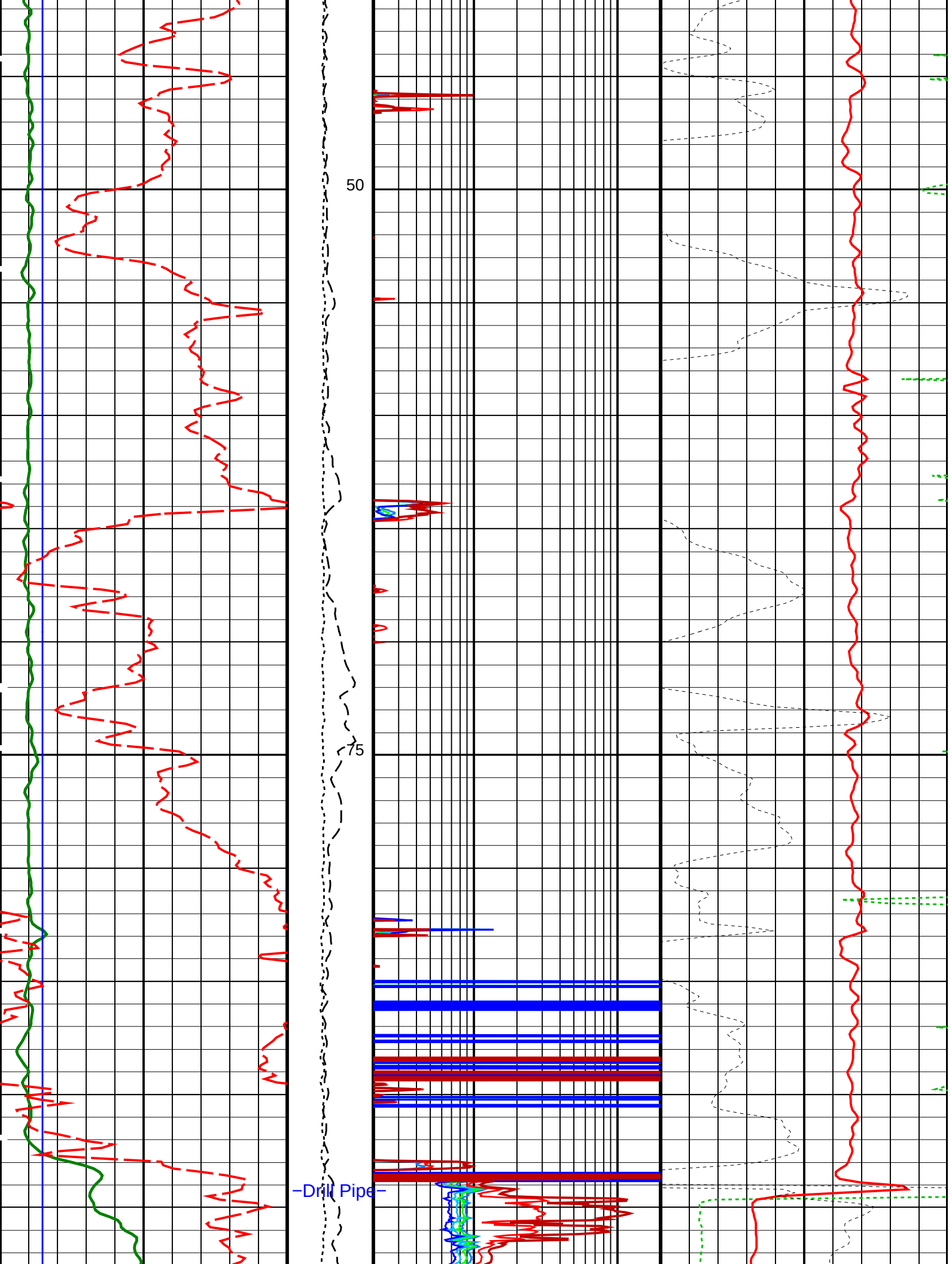
Sea Floor Depth Reference

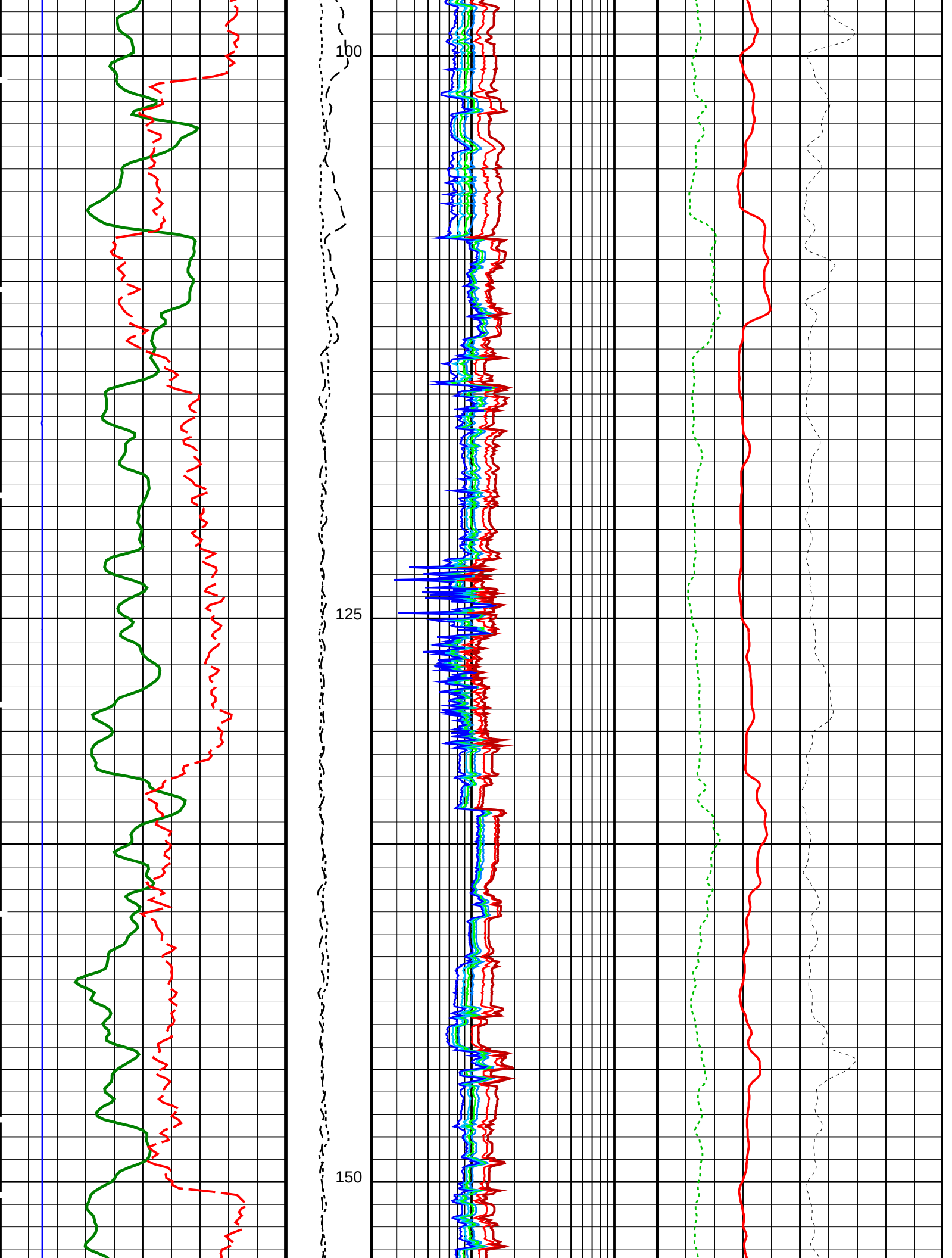
Flipped Downlog

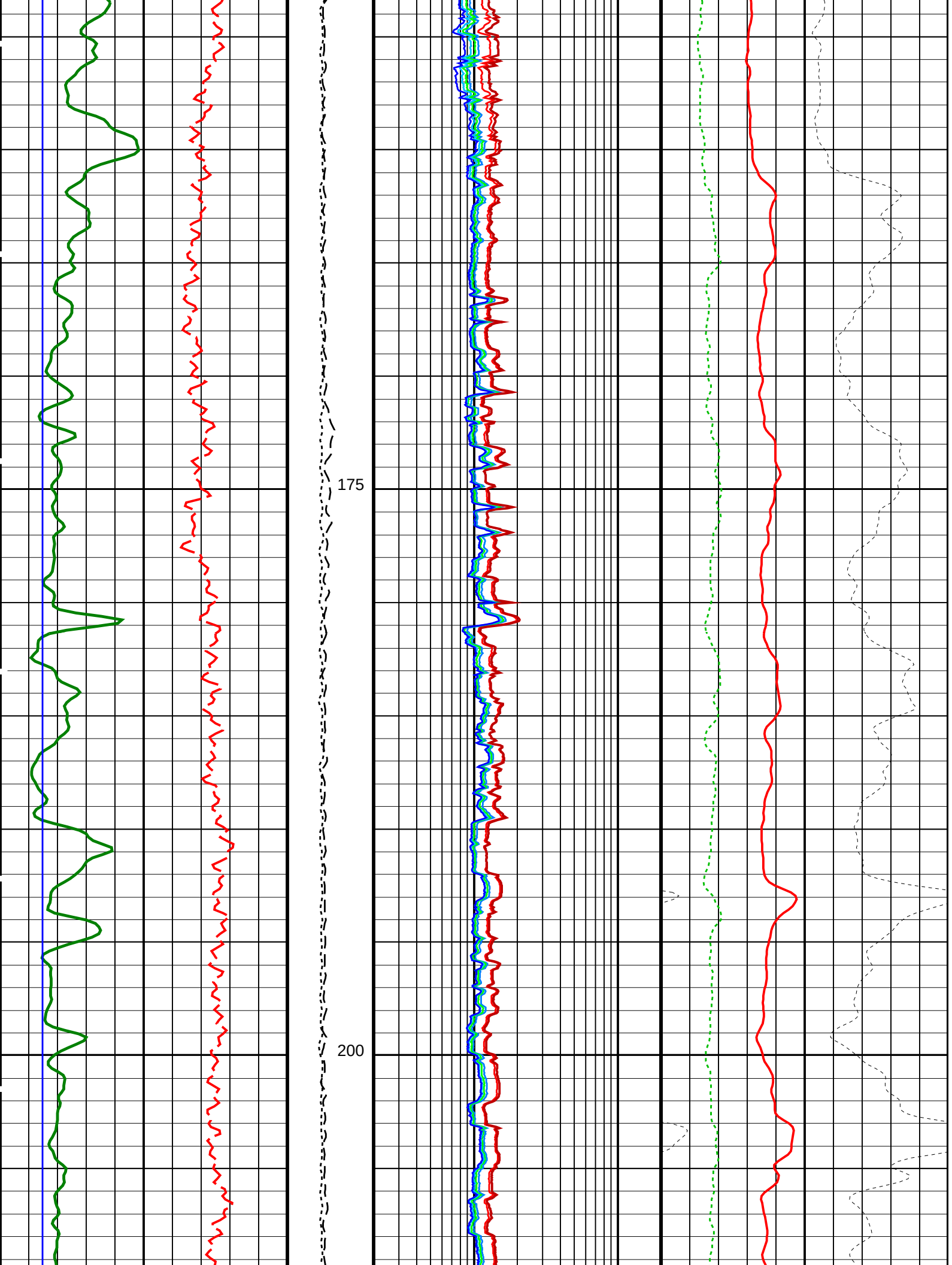
HNGS Spectroscopy Gamma Ray (HSGR) 0 (GAPI) 100		HRLT True Resistivity (RT_HRLT) 0.2 (OHMM) 20	
		HRLT Resistivity 1 (RLA1) 0.2 (OHMM) 20	
		HRLT Resistivity 2 (RLA2) 0.2 (OHMM) 20	HLDS Bulk Density Correction (DRH) -0.25 (G/C3) 0.25
		HRLT Resistivity 3 (RLA3) 0.2 (OHMM) 20	HLDS Bulk Density (RHOM) 0 (G/C3) 4
SP (SP) -100 (MV) 0	Calibrated Downhole Force (CDF) (LBF) 3000 0	HRLT Resistivity 5 (RLA5) 0.2 (OHMM) 20	HLDS Long Spaced Photoelectric Effect (PEFL) 0 (----) 10
HLDS Caliper (LCAL) 0 (IN) 20	Tension (TENS) (LBF) 10000 0	HRLT Resistivity 4 (RLA4) 0.2 (OHMM) 20	APS Corrected Standoff Porosity (STPC) 100 (PU) 0

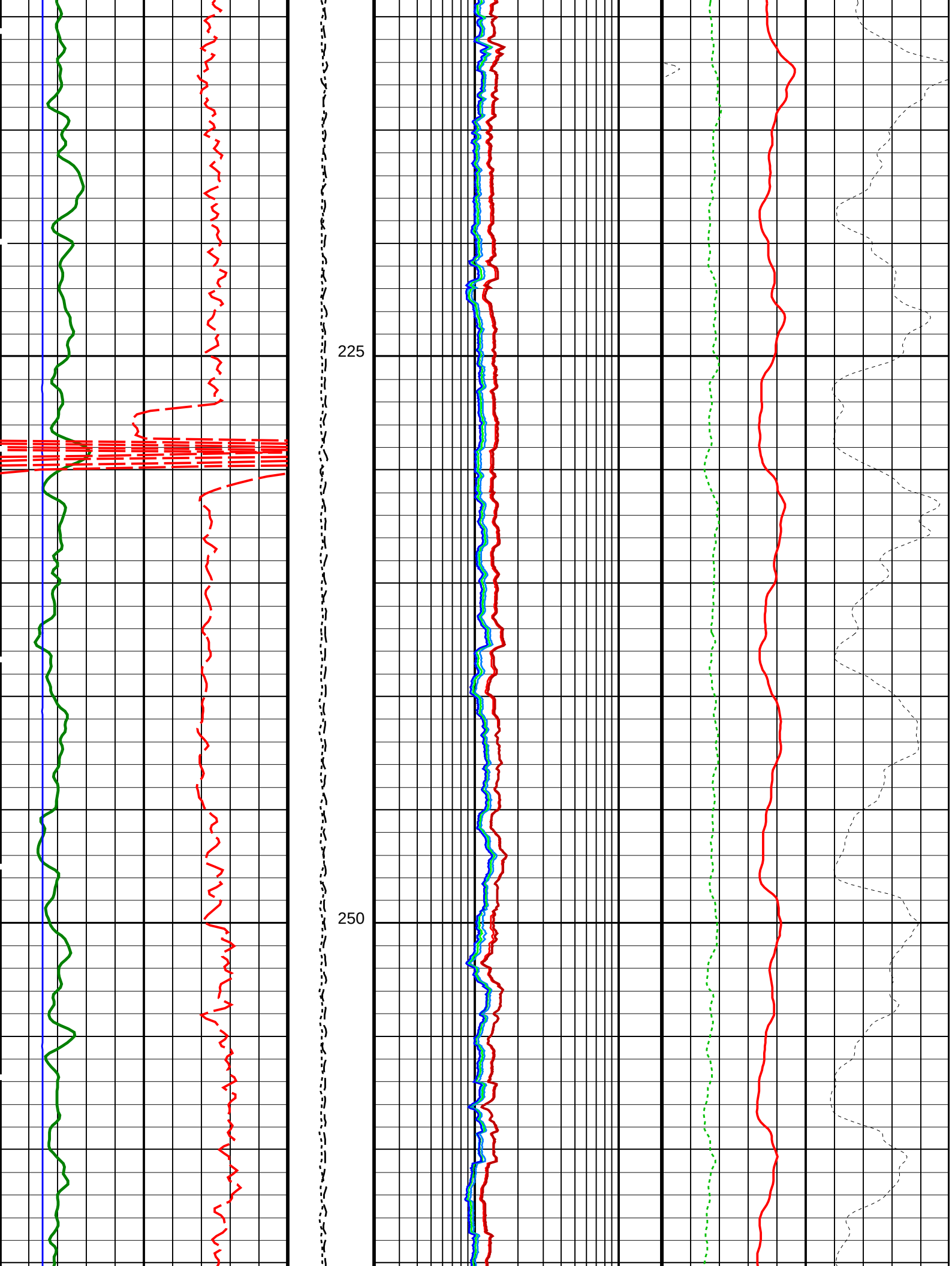


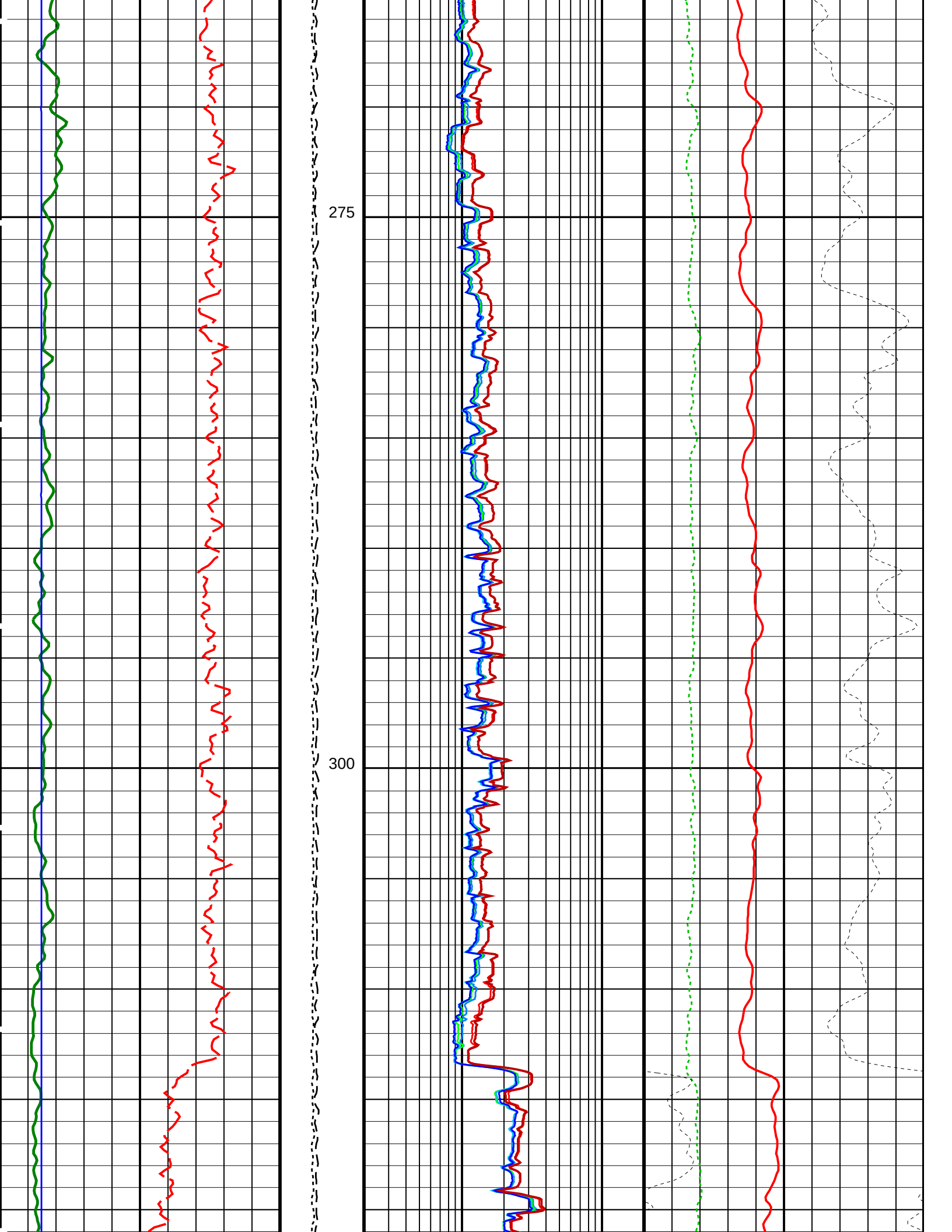

Sea Floor
0
25

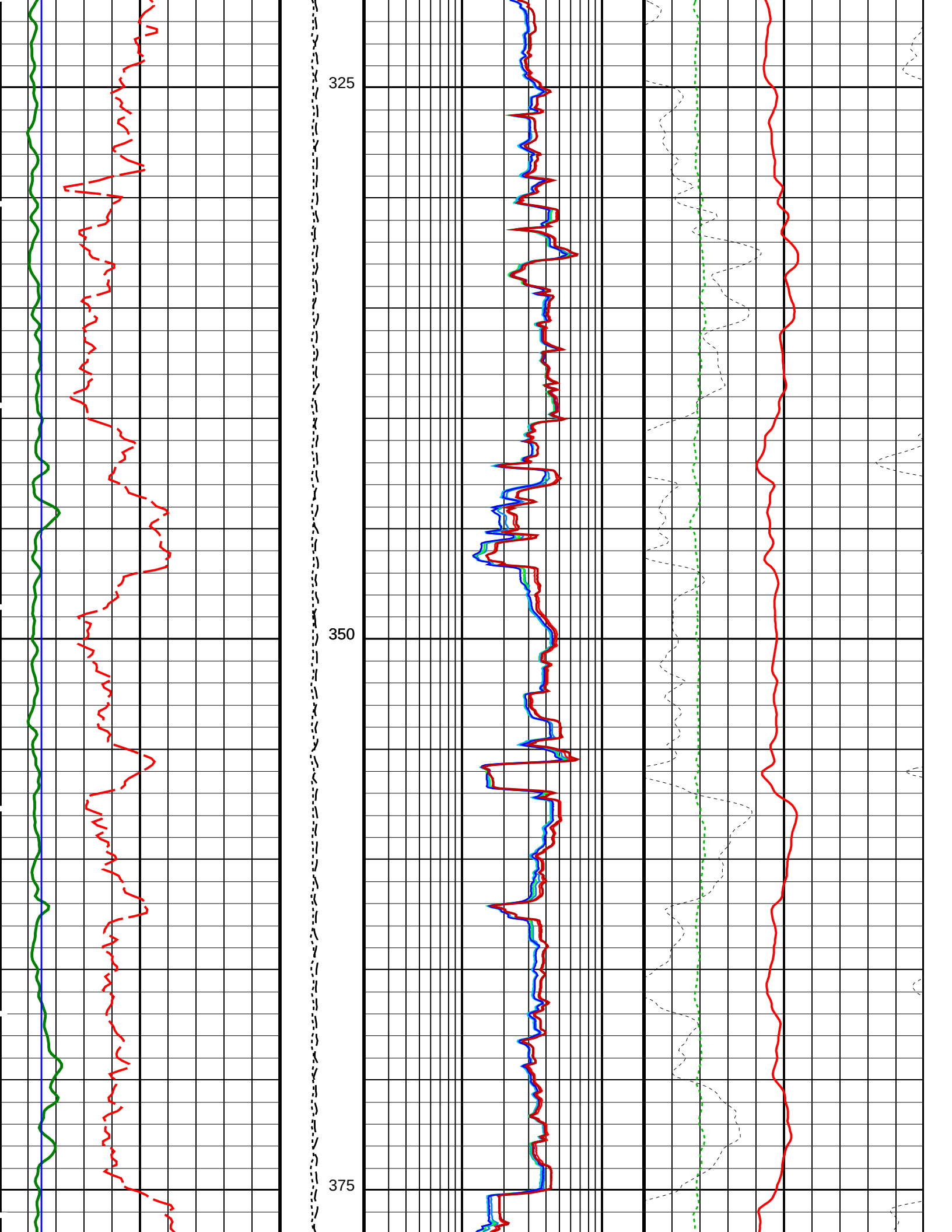

50
75
−Drill Pipe−

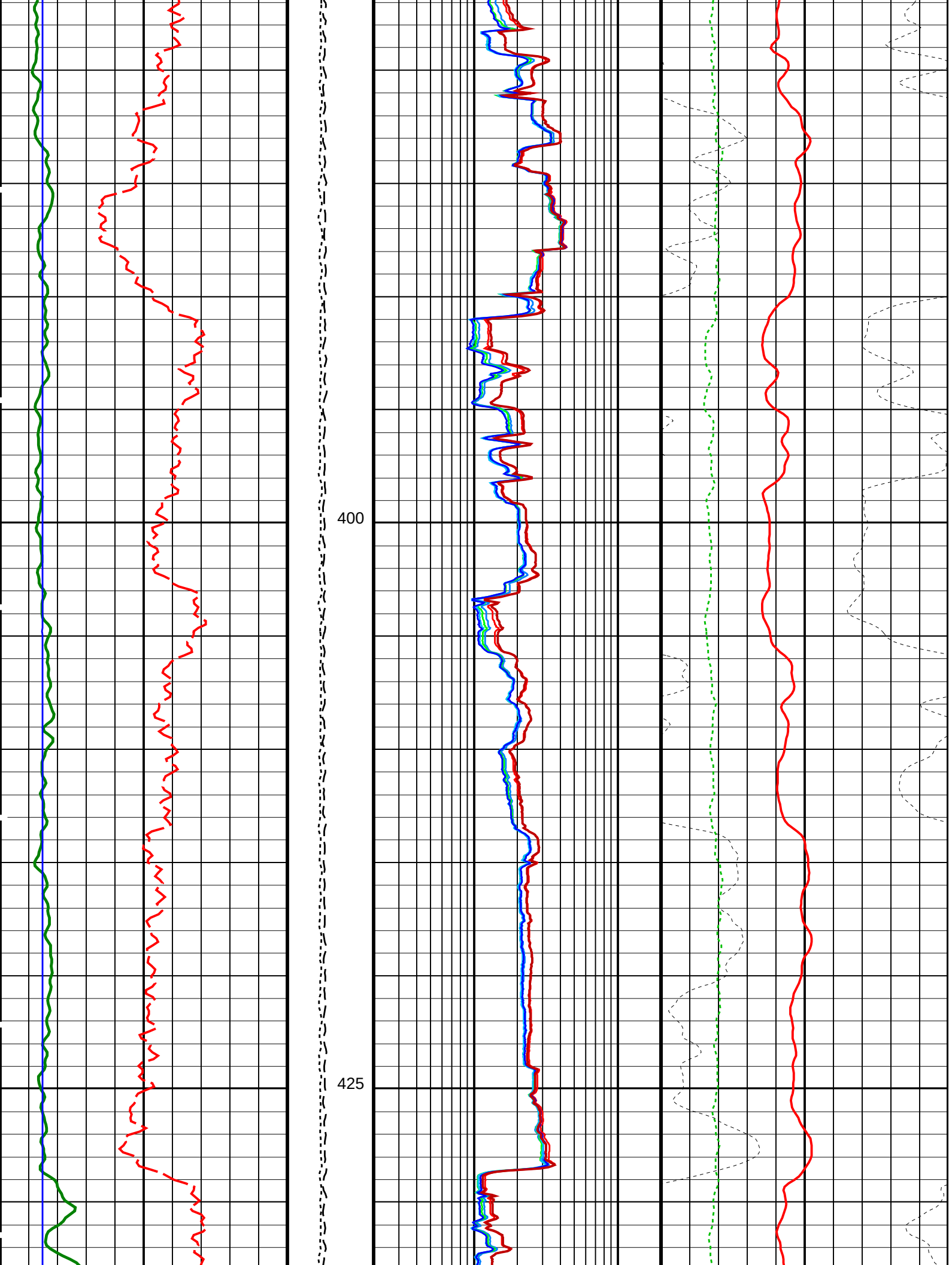

100
125
150

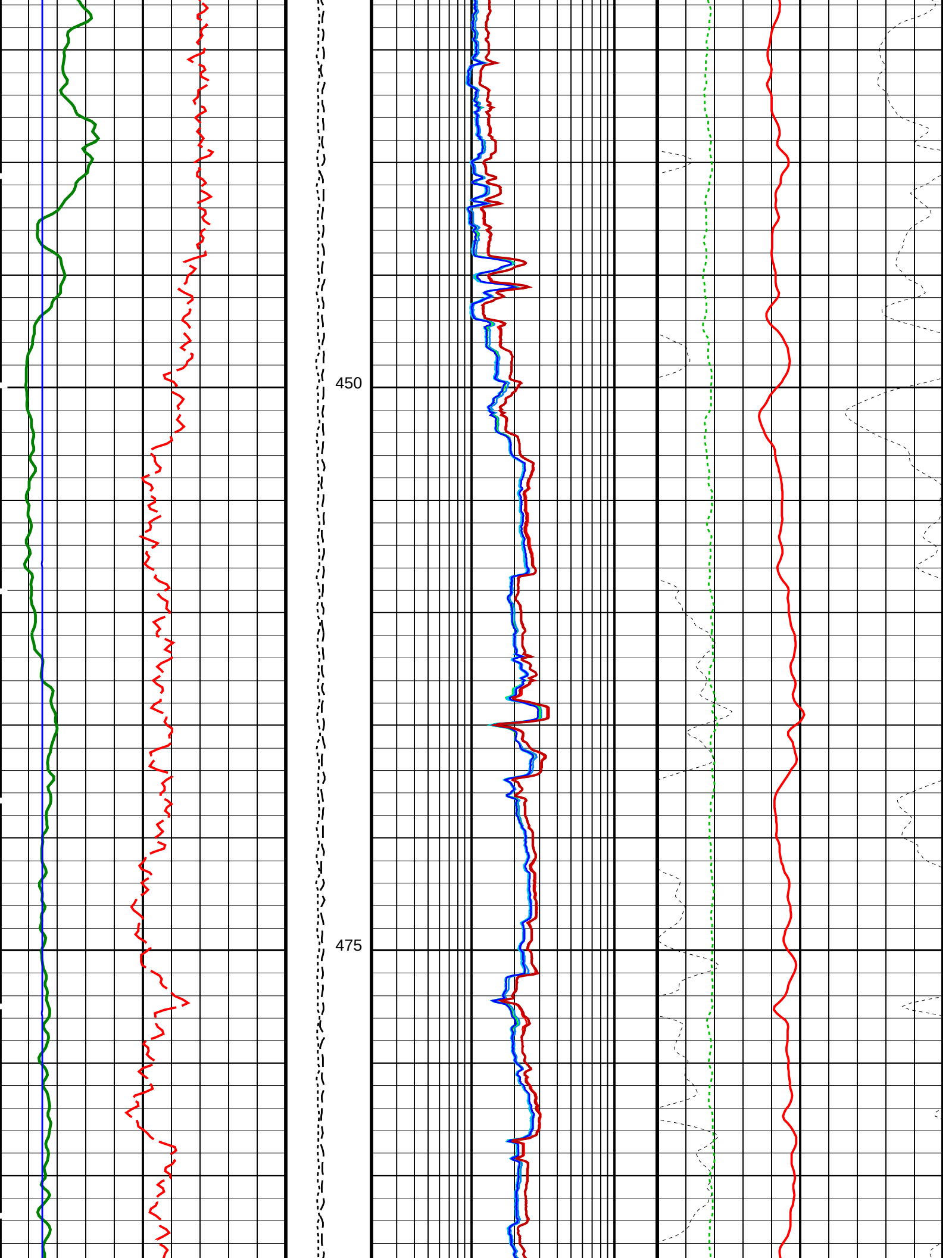

175
200

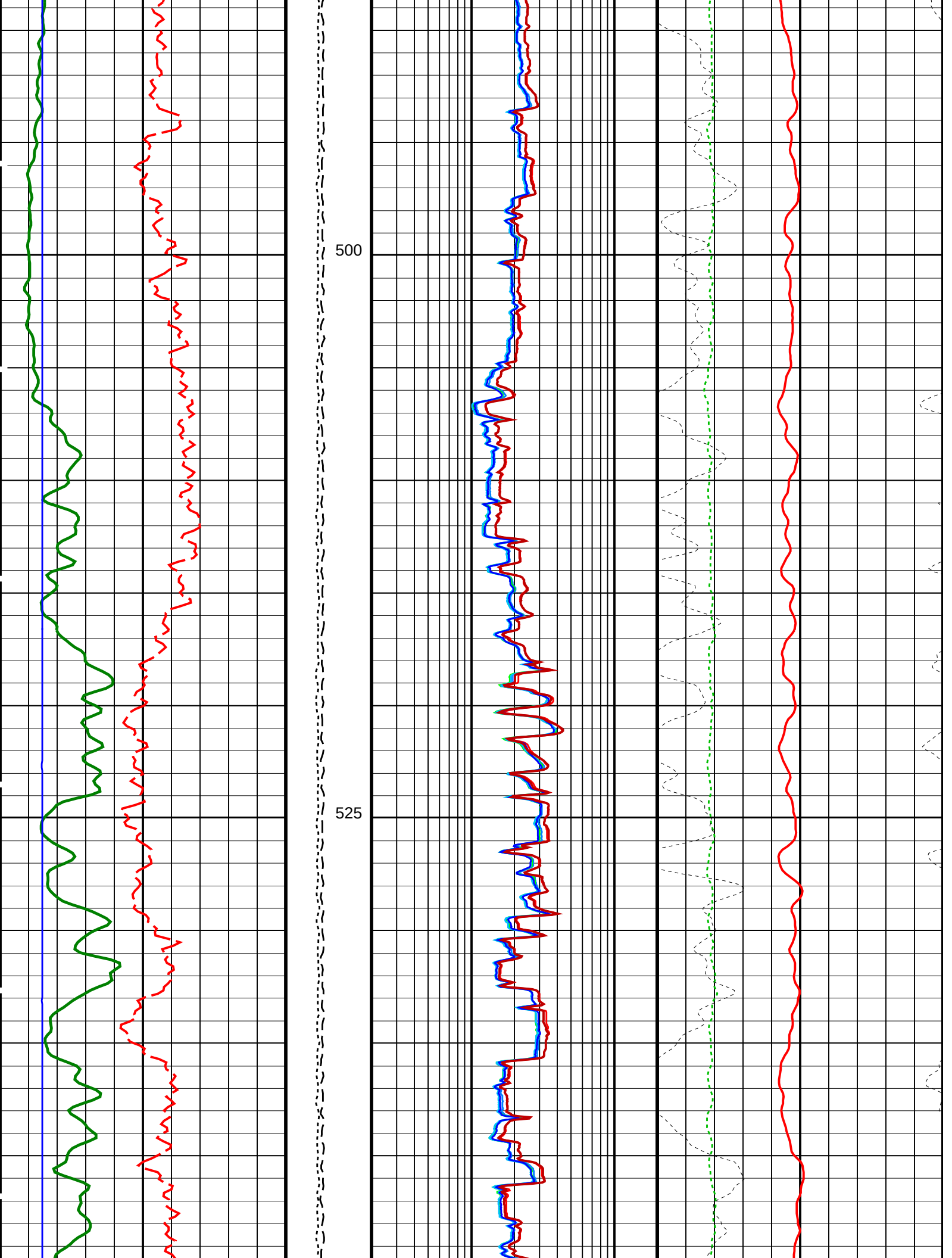

225
250

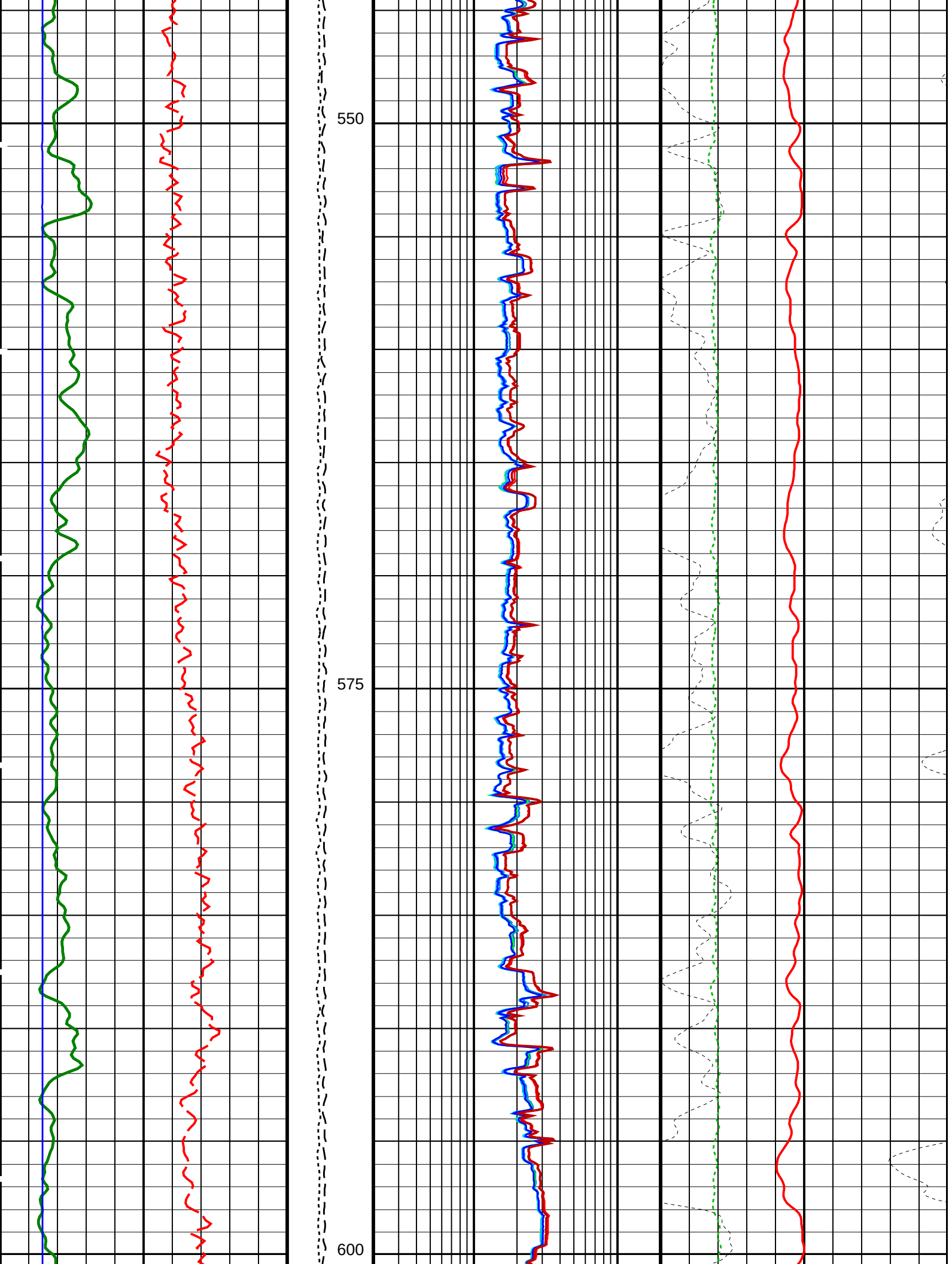

275
300

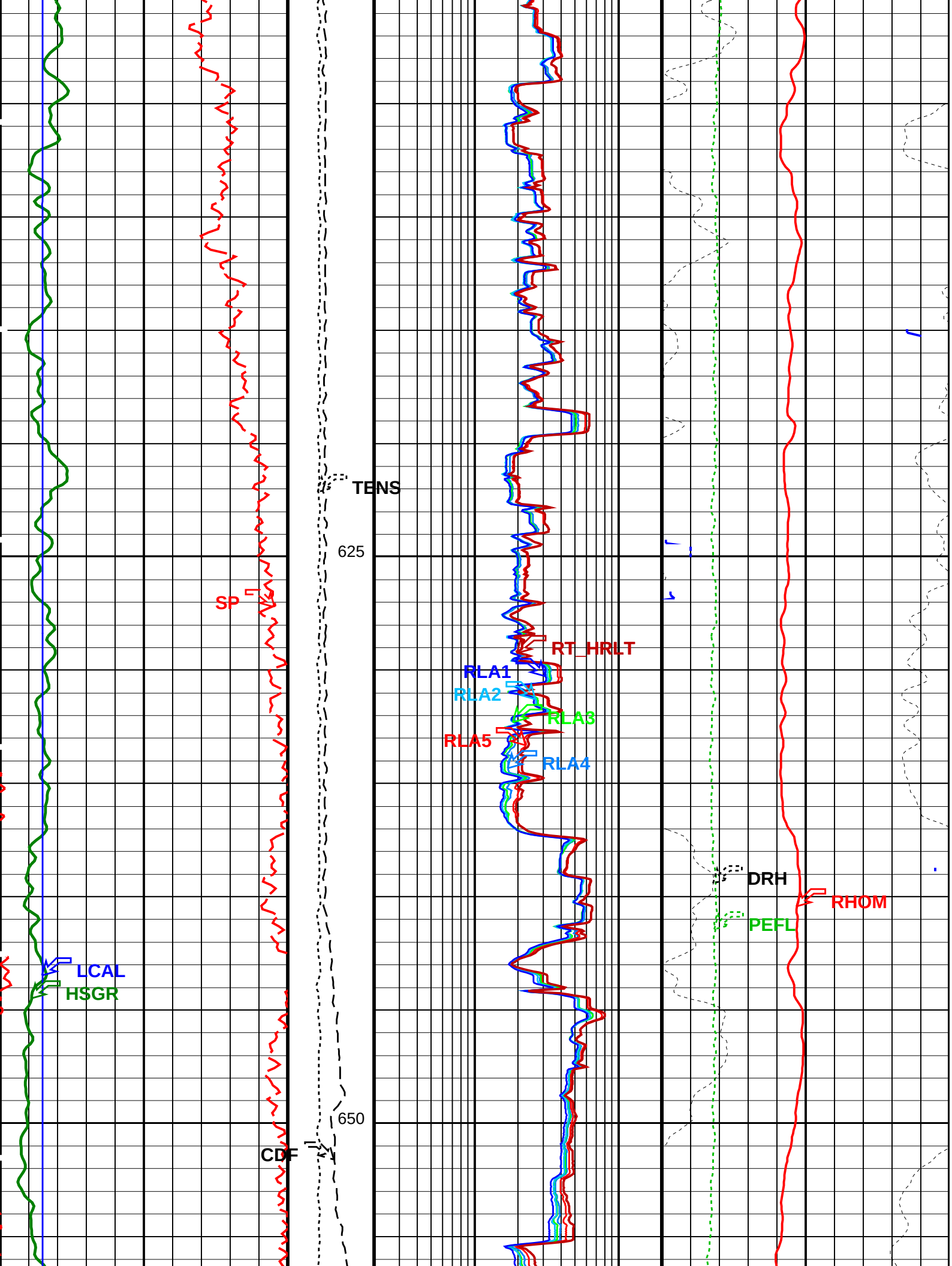

325
350
375

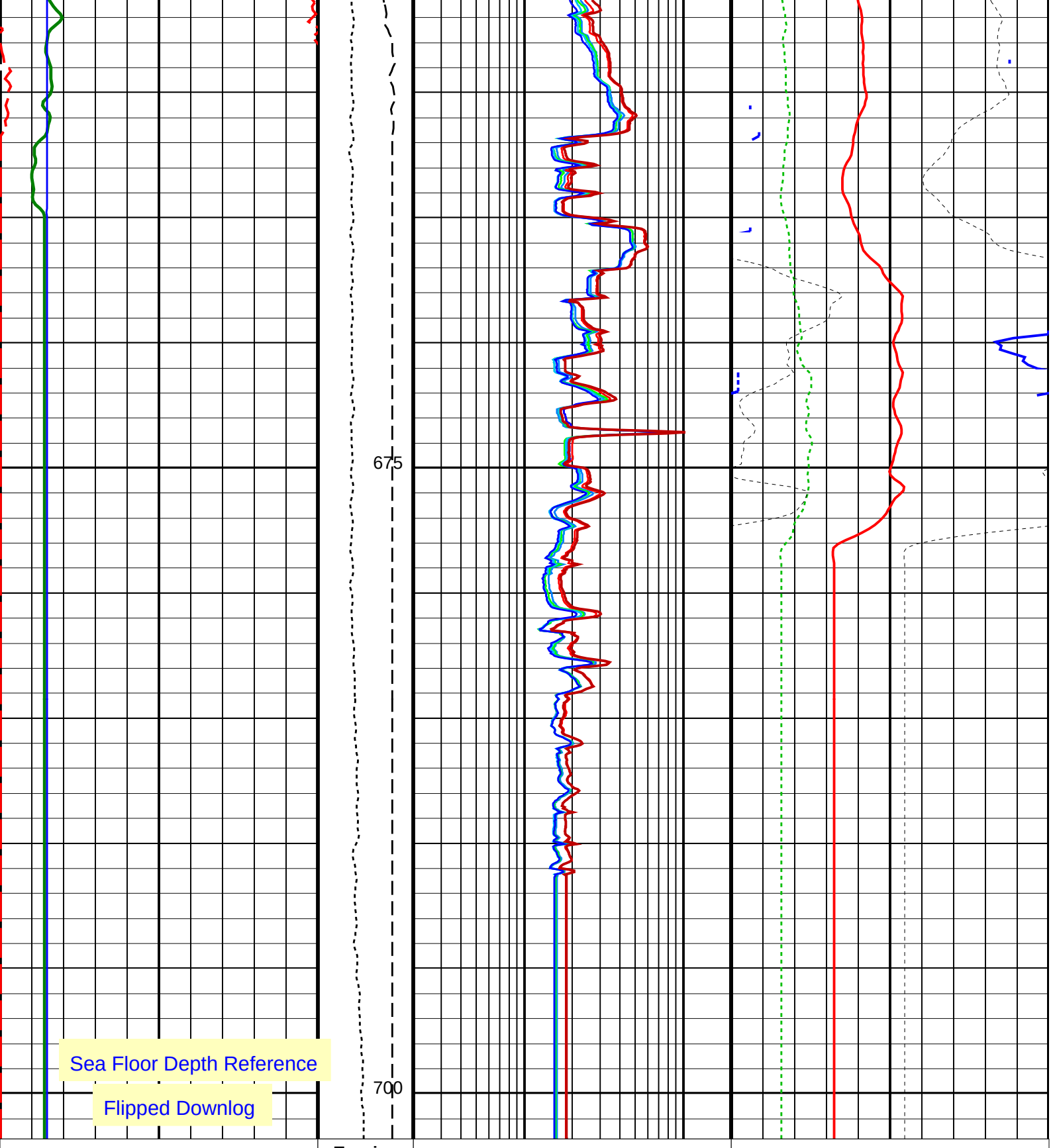

400
425


450
475


500
525


550
575
600


TENS
625
SP
RT_HRLT
RLA1
RLA2
RLA3
RLA5
RLA4
DRH
RHOM
PEFL
LCAL
HSGR
650
CDF



HLDS Caliper (LCAL) 0 (IN) 20	Tension (TENS) (LBF) 10000 0	HRLT Resistivity 4 (RLA4) 0.2 (OHMM) 20
APS Corrected Standoff Porosity (STPC) 100 (PU) 0		
SP (SP) −100 (MV) 0	Calibrated Downhole Force (CDF) (LBF) 3000 0	HRLT Resistivity 5 (RLA5) 0.2 (OHMM) 20
HLDS Long Spaced Photoelectric Effect (PEFL) 0 (−−−−) 10		
HNGS Spectroscopy Gamma Ray (HSGR)		HRLT Resistivity 3 (RLA3)
HLDS Bulk Density (RHOM)		

0	(GAPI)	100

0.2	(OHMM)	20

0	(G/C3)	4

HRLT Resistivity 2 (RLA2)		
0.2	(OHMM)	20

HLDS Bulk Density Correction (DRH)		
−0.25	(G/C3)	0.25

HRLT Resistivity 1 (RLA1)		
0.2	(OHMM)	20

HRLT True Resistivity (RT_HRLT)		
0.2	(OHMM)	20

PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	HRLT−B: High Resolution Laterolog Array − B		
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	30	DEGC
CALSTAT	HRLTB Calibration Status	SHALLOW_DONE	
CALTEMP	HRLTB Calibration Temperature	13.133	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	0.018227	DC/M
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	
PROCMSO	Mechanical Standoff Fin Size	0	IN
PROCRM	Processing Mud Resistivity Select	HRLT_Compute	
PROCSPO	Sonde Position	Centered	
SHT	Surface Hole Temperature	35	DEGC
	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	ON	
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	
	APS−C: Accelerator−Porosity Tool		
	APS Software Version	0	
AASD	APS Thermal and Array Detectors High Voltage Setting	1939.6	V
ADSO	APS Array Detectors Data Source Switch	Both	
AFSD	APS Far Detector High Voltage Setting	2035.3	V
AHCS	APS Holesize Correction Source	BS	
AHSS	APS Holesize Correction Switch	ON	
AMTY	APS Environmental Corrections Mud Type	WaterBaseBarite	
ANSD	APS Near Detector High Voltage Setting	1695.91	V

ANSD	APS Near Detector High Voltage Setting	1095.91	V
ASOS	APS Standoff Correction Switch	ON	
ATSS	APS Temperature−Pressure−Salinity Correction Switch	OFF	
BHFL_APS	APS TNPH Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	30	DEGC
BSCO_APS	APS TNPH Borehole Salinity Correction Option	NO	
DPPM	Density Porosity Processing Mode	HIRS	
DSCO_APS	APS TNPH Density Source Correction Option	MEASURED	
FSAL	Formation Salinity	−50000	PPM
FSCO_APS	APS TNPH Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCO_APS	APS TNPH Hole Size Correction Option	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MCCO_APS	APS TNPH Mud Cake Correction Option	NO	
MCOR_APS	APS TNPH Mud Correction	NATU	
MWCO_APS	APS TNPH Mud Weight Correction Option	NO	
NARC	APS Near/Array Calibration Ratio	1.08307	
NFRC	APS Near/Far Calibration Ratio	0.974536	
PTCO_APS	APS TNPH Pressure/Temperature Correction Option	NO	
SHT	Surface Hole Temperature	35	DEGC
TNCO_APS	APS TNPH Computation Option	YES	
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)	30	DEGC
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	0.018227	DC/M
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	−0.0015838	
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	35	DEGC
TPOS	Tool Position	CENT	
VBA1	HNGS Detector 1 Variable Barite Factor Running Average	1.02794	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	1.01954	
EDTC−B: Enhanced DTS Cartridge			
BHFL	Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	30	DEGC
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	0.018227	DC/M
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	NO	
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	35	DEGC
SOCN	Standoff Distance	0.5	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	
BSP: Bridle SP			
SPNV	SP Next Value	0	MV
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	5.500	IN
CWEI	Casing Weight	168.00	LB/F
DFD	Drilling Fluid Density	1.03	G/C3
DO	Depth Offset for Playback	−4711.0	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	5411	M
TDD	Total Depth − Driller	5411.00	M
TDL	Total Depth − Logger	5415.00	M
TWS	Temperature of Connate Water Sample	37.78	DEGC

Format: TripleCombo **Vertical Scale: 1:200** **Graphics File Created: 25−Jul−2014 17:31**

OP System Version: 19C0−187

MSS_LDEO−A	19C0−187	HRLT−B	19C0−187
HLDS	19C0−187	LDSC−B	19C0−187
APS−C	19C0−187	HNGC−B	19C0−187
HNGS−BA	19C0−187	EDTC−B	SKK−5169−EDTCB
BSP	19C0−187		

Input DLIS Files

DEFAULT	MSS_LDEO_HRLA_LDL_014PUP	FN:21	PRODUCER	25−Jul−2014 16:41	5412.2 M	4663.1 M

Output DLIS Files

DEFAULT	MSS_LDEO_HRLA_LDL_017PUP	FN:26	PRODUCER	25−Jul−2014 17:31
BACKUP	MSS_LDEO_HRLA_LDL_017PUP	FN:27	PRODUCER	25−Jul−2014 17:31

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High Resolution Laterolog Array − B Wellsite Calibration − HRLT M01							
Before: 25−Jul−2014 10:35 After: 25−Jul−2014 16:14							
HRLT M0−M1 Voltage Plus − 0	0	N/A	−318.6	−318.8	−0.1765	9.681	UV
HRLT M0−M1 Voltage Plus − 1	0	N/A	−328.5	−333.5	−5.048	9.681	UV
HRLT M0−M1 Voltage Plus − 2	0	N/A	−331.3	−334.6	−3.287	9.681	UV
HRLT M0−M1 Voltage Plus − 3	0	N/A	−335.4	−338.0	−2.565	9.681	UV
HRLT M0−M1 Voltage Plus − 4	0	N/A	−325.2	−326.2	−1.009	9.681	UV
HRLT M0−M1 Voltage Plus − 5	0	N/A	−321.7	−322.2	−0.5380	9.681	UV
HRLT M0−M1 Voltage Plus − 6	0	N/A	320.5	324.6	4.078	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: 25−Jul−2014 10:35 After: 25−Jul−2014 16:14							
HRLT M1−M2 Voltage Plus − 0	0	N/A	1754	1752	−1.392	53.42	UV
HRLT M1−M2 Voltage Plus − 1	0	N/A	1811	1835	23.48	53.42	UV
HRLT M1−M2 Voltage Plus − 2	0	N/A	1821	1834	13.63	53.42	UV
HRLT M1−M2 Voltage Plus − 3	0	N/A	1842	1852	9.989	53.42	UV
HRLT M1−M2 Voltage Plus − 4	0	N/A	1785	1787	2.206	53.42	UV
HRLT M1−M2 Voltage Plus − 5	0	N/A	1767	1766	−0.2141	53.42	UV
HRLT M1−M2 Voltage Plus − 6	0	N/A	−1776	−1794	−17.86	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: 25−Jul−2014 10:35 After: 25−Jul−2014 16:14							
HRLT M2−M3 Voltage Plus − 0	0	N/A	1740	1738	−2.445	53.42	UV
HRLT M2−M3 Voltage Plus − 1	0	N/A	1811	1832	21.08	53.42	UV
HRLT M2−M3 Voltage Plus − 2	0	N/A	1820	1833	12.35	53.42	UV

HRLT M2−M3 Voltage Plus − 3	0	N/A	1846	1854	8.723	53.42	UV
HRLT M2−M3 Voltage Plus − 4	0	N/A	1782	1783	0.9452	53.42	UV
HRLT M2−M3 Voltage Plus − 5	0	N/A	1764	1763	−0.9287	53.42	UV
HRLT M2−M3 Voltage Plus − 6	0	N/A	−1765	−1780	−15.48	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: 25−Jul−2014 10:35 After: 25−Jul−2014 16:14

HRLT A3−A4 Voltage Plus − 0	0	N/A	68350	68360	5.008	2100	UV
HRLT A3−A4 Voltage Plus − 1	0	N/A	70890	71850	954.6	2100	UV
HRLT A3−A4 Voltage Plus − 2	0	N/A	71590	72170	580.9	2100	UV
HRLT A3−A4 Voltage Plus − 3	0	N/A	72820	73280	454.7	2100	UV
HRLT A3−A4 Voltage Plus − 4	0	N/A	70290	70440	145.7	2100	UV
HRLT A3−A4 Voltage Plus − 5	0	N/A	69610	69660	49.84	2100	UV
HRLT A3−A4 Voltage Plus − 6	0	N/A	−68110	−68840	−722.0	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: 25−Jul−2014 10:35 After: 25−Jul−2014 16:14

HRLT A4−A5 Voltage Plus − 0	0	N/A	68630	68640	10.03	2100	UV
HRLT A4−A5 Voltage Plus − 1	0	N/A	71280	72230	950.9	2100	UV
HRLT A4−A5 Voltage Plus − 2	0	N/A	71930	72530	594.0	2100	UV
HRLT A4−A5 Voltage Plus − 3	0	N/A	73150	73630	473.6	2100	UV
HRLT A4−A5 Voltage Plus − 4	0	N/A	70590	70740	146.4	2100	UV
HRLT A4−A5 Voltage Plus − 5	0	N/A	69890	69950	53.08	2100	UV
HRLT A4−A5 Voltage Plus − 6	0	N/A	−68470	−69220	−753.3	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: 25−Jul−2014 10:35 After: 25−Jul−2014 16:14

HRLT A5−A6 Voltage Plus − 0	0	N/A	68530	68540	15.68	2100	UV
HRLT A5−A6 Voltage Plus − 1	0	N/A	71010	71950	941.8	2100	UV
HRLT A5−A6 Voltage Plus − 2	0	N/A	71710	72290	581.7	2100	UV
HRLT A5−A6 Voltage Plus − 3	0	N/A	72970	73430	459.2	2100	UV
HRLT A5−A6 Voltage Plus − 4	0	N/A	70440	70590	150.4	2100	UV
HRLT A5−A6 Voltage Plus − 5	0	N/A	69770	69830	61.48	2100	UV
HRLT A5−A6 Voltage Plus − 6	0	N/A	−68200	−68930	−731.6	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: 25−Jul−2014 10:35 After: 25−Jul−2014 16:14

HRLT Torpedo−M0 Voltage − 0	0	N/A	−68200	−68220	−14.38	2100	UV
HRLT Torpedo−M0 Voltage − 1	0	N/A	−71320	−72290	−969.3	2100	UV
HRLT Torpedo−M0 Voltage − 2	0	N/A	−72000	−72610	−611.6	2100	UV
HRLT Torpedo−M0 Voltage − 3	0	N/A	−73260	−73720	−460.8	2100	UV
HRLT Torpedo−M0 Voltage − 4	0	N/A	−70650	−70810	−153.8	2100	UV
HRLT Torpedo−M0 Voltage − 5	0	N/A	−69940	−69980	−45.13	2100	UV
HRLT Torpedo−M0 Voltage − 6	0	N/A	68460	69200	738.8	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: 25−Jul−2014 10:35 After: 25−Jul−2014 16:14

HRLT Bridle#9−M0 Voltage − 0	0	N/A	−68200	−68210	−11.98	2100	UV
HRLT Bridle#9−M0 Voltage − 1	0	N/A	−71290	−72260	−969.3	2100	UV
HRLT Bridle#9−M0 Voltage − 2	0	N/A	−71970	−72590	−619.4	2100	UV
HRLT Bridle#9−M0 Voltage − 3	0	N/A	−73230	−73700	−468.7	2100	UV
HRLT Bridle#9−M0 Voltage − 4	0	N/A	−70640	−70790	−154.5	2100	UV
HRLT Bridle#9−M0 Voltage − 5	0	N/A	−69920	−69980	−61.20	2100	UV
HRLT Bridle#9−M0 Voltage − 6	0	N/A	68440	69180	740.5	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: 25−Jul−2014 10:35 After: 25−Jul−2014 16:14

HRLT Source Current Plus − 0	0	N/A	284.4	284.4	0.01572	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: 25−Jul−2014 10:35 After: 25−Jul−2014 16:14

HRLT Vertical Voltage Pl − 0	0	N/A	−321.4	−321.1	0.3200	9.681	UV
HRLT Vertical Voltage Pl − 1	0	N/A	−323.9	−328.1	−4.165	9.681	UV
HRLT Vertical Voltage Pl − 2	0	N/A	−325.7	−328.0	−2.305	9.681	UV
HRLT Vertical Voltage Pl − 3	0	N/A	−327.8	−329.6	−1.758	9.681	UV
HRLT Vertical Voltage Pl − 4	0	N/A	−314.8	−315.2	−0.4297	9.681	UV
HRLT Vertical Voltage Pl − 5	0	N/A	−326.4	−326.4	−0.01053	9.681	UV
HRLT Vertical Voltage Pl − 6	0	N/A	328.9	332.2	3.289	9.681	UV
HRLT Vertical Voltage Pl − 7	0	N/A	−322.7	−322.7	0	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: 16−Jul−2014 4:36 Before: 17−Jul−2014 5:36 After: 17−Jul−2014 5:45

SS Cs Resolution Bkg	9.000	8.061	8.076	7.968	−0.1079	1.800	%
LS Cs Resolution Bkg	9.000	8.137	8.180	8.175	−0.005135	1.800	%
LSW1 Background	100.0	69.74	68.24	70.48	2.248	3.000	CPS
LSW2 Background	100.0	63.61	64.16	63.74	−0.4206	3.000	CPS
LSW3 Background	200.0	141.8	137.9	141.1	3.244	6.000	CPS
LSW4 Background	250.0	172.4	171.0	170.7	−0.2442	7.500	CPS
LSW5 Background	600.0	395.0	391.5	393.4	1.954	18.00	CPS
SSW1 Background	100.0	78.54	77.29	78.86	1.570	3.000	CPS
SSW2 Background	200.0	139.1	138.0	138.2	0.2109	6.000	CPS
SSW3 Background	500.0	371.9	374.7	371.5	−3.237	15.00	CPS
SSW4 Background	270.0	195.4	192.7	195.5	2.744	8.100	CPS
SSW5 Background	200.0	142.5	140.4	142.0	1.542	6.000	CPS

Hostile Litho−Density Sonde Wellsite Calibration − Aluminum Measurement
Master: 16−Jul−2014 5:05

LSW1 Aluminum	600.0	508.4	N/A	N/A	N/A	N/A	CPS
LSW2 Aluminum	900.0	733.7	N/A	N/A	N/A	N/A	CPS
LSW3 Aluminum	1100	883.4	N/A	N/A	N/A	N/A	CPS
LSW4 Aluminum	580.0	447.4	N/A	N/A	N/A	N/A	CPS
LSW5 Aluminum	570.0	407.5	N/A	N/A	N/A	N/A	CPS
SSW1 Aluminum	2800	2389	N/A	N/A	N/A	N/A	CPS
SSW2 Aluminum	8000	6455	N/A	N/A	N/A	N/A	CPS
SSW3 Aluminum	11600	8951	N/A	N/A	N/A	N/A	CPS
SSW4 Aluminum	5000	3637	N/A	N/A	N/A	N/A	CPS
SSW5 Aluminum	660.0	442.1	N/A	N/A	N/A	N/A	CPS

Hostile Litho−Density Sonde Wellsite Calibration − Lithology Measurement
Master: 16−Jul−2014 4:57

LSW1 Iron	400.0	349.8	N/A	N/A	N/A	N/A	CPS
LSW2 Iron	730.0	590.1	N/A	N/A	N/A	N/A	CPS
LSW3 Iron	1000	785.3	N/A	N/A	N/A	N/A	CPS
LSW4 Iron	520.0	408.9	N/A	N/A	N/A	N/A	CPS
LSW5 Iron	470.0	376.5	N/A	N/A	N/A	N/A	CPS
SSW1 Iron	2100	1743	N/A	N/A	N/A	N/A	CPS
SSW2 Iron	6800	5378	N/A	N/A	N/A	N/A	CPS
SSW3 Iron	10800	8163	N/A	N/A	N/A	N/A	CPS
SSW4 Iron	4600	3323	N/A	N/A	N/A	N/A	CPS
SSW5 Iron	580.0	390.1	N/A	N/A	N/A	N/A	CPS

Hostile Litho−Density Sonde Wellsite Calibration − Caliper Calibration
Before: 17−Jul−2014 5:38

HLDS Caliper Small Ring	12.00	N/A	15.84	N/A	N/A	N/A	IN
HLDS Caliper Large Ring	15.19	N/A	19.69	N/A	N/A	N/A	IN

Accelerator−Porosity Tool Wellsite Calibration − Detector Background
Master: 16−Jul−2014 2:13 Before: 25−Jul−2014 10:41 After: 25−Jul−2014 16:17

Near Det Bkg Cntrate	30.00	26.61	25.31	24.64	−0.6673	N/A	CPS
Far Det Bkg Cntrate	30.00	29.50	28.75	28.13	−0.6175	N/A	CPS
Array−1 Det Bkg Cntrate	30.00	26.43	27.75	25.53	−2.219	N/A	CPS
Array−2 Det Bkg Cntrate	30.00	26.28	25.33	26.88	1.551	N/A	CPS
Array Therm Det Bkg Cntrate	30.00	26.35	26.69	28.83	2.136	N/A	CPS

Accelerator−Porosity Tool Wellsite Calibration − Calibration Ratios
Master: 16−Jul−2014 2:16

Near/Far Calibration Ratio	0.9250	0.9745	N/A	N/A	N/A	N/A	
Near/Array Calibration Ratio	1.030	1.083	N/A	N/A	N/A	N/A	
Near/Array Cal Ratio Up/Down	1.000	1.014	N/A	N/A	N/A	N/A	

Accelerator−Porosity Tool Wellsite Calibration − Tank Check
Master: 16−Jul−2014 2:16

Array−1 Standoff Porosity	11.75	10.47	N/A	N/A	N/A	N/A	PU
Array−2 Standoff Porosity	11.75	10.65	N/A	N/A	N/A	N/A	PU
Average Slowing Down Time	6.000	6.035	N/A	N/A	N/A	N/A	US
Array−1 SDT Ratio Up/Down	1.000	0.9776	N/A	N/A	N/A	N/A	
Array−2 SDT Ratio Up/Down	1.000	0.9742	N/A	N/A	N/A	N/A	
Sigma Formation	27.50	33.77	N/A	N/A	N/A	N/A	CU

Accelerator−Porosity Tool Wellsite Calibration − CCR7 signal boxes
Master: 16−Jul−2014 1:19

Near Detector Plateau Setting	1650	1696	N/A	N/A	N/A	N/A	V
Far Detector Plateau Setting	2000	2035	N/A	N/A	N/A	N/A	V
Array Detector Plateau Setting	2000	1940	N/A	N/A	N/A	N/A	V

Hostile Natural Gamma Ray Sonde Wellsite Calibration − Detector 1 Check
Master: 15−Jul−2014 0:16 Before: 15−Jul−2014 8:28 After: 15−Jul−2014 8:42

Na 511 Peak Loc	40.00	39.57	39.75	39.77	0.02731	1.000	
Na 511 Peak Res	15.50	15.78	15.47	15.60	0.1276	2.000	%
High Voltage	1150	1197	1198	1197	−0.5396	N/A	V

Na 1785 Peak Loc	142.6	142.4	143.3	142.8	−0.5427	7.000	
Na 1785 Peak Res	8.500	9.334	9.234	8.659	−0.5749	2.000	%
Temperature	15.50	37.42	37.47	37.56	0.09754	N/A	DEGC
Na Count Rate	45.00	10.91	10.93	10.90	−0.02571	8.000	CPS

Hostile Natural Gamma Ray Sonde Wellsite Calibration − Detector 2 Check
Master: 15−Jul−2014 0:16 Before: 15−Jul−2014 8:28 After: 15−Jul−2014 8:42

Na 511 Peak Loc	40.00	39.46	39.66	39.81	0.1556	1.000	
Na 511 Peak Res	15.50	16.20	15.73	15.53	−0.2004	2.000	%
High Voltage	1150	1129	1129	1130	1.742	N/A	V
Na 1785 Peak Loc	142.6	141.8	140.1	143.7	3.554	7.000	
Na 1785 Peak Res	8.500	10.06	10.03	8.567	−1.463	2.000	%
Temperature	15.50	38.37	38.33	38.34	0.006504	N/A	DEGC
Na Count Rate	45.00	11.54	11.55	11.30	−0.2470	8.000	CPS

Hostile Natural Gamma Ray Sonde Wellsite Calibration − Ratio Of Detector 1 To Detector 2
Master: 15−Jul−2014 0:16 Before: 15−Jul−2014 8:28 After: 15−Jul−2014 8:42

Coincidence Count Rate Ratio	1.000	0.9495	0.9508	0.9685	0.01775	0.05000	

Hostile Natural Gamma Ray Sonde Master Calibration − Detector 1 Calibration
Master: 14−Jul−2014 23:07

Na 511 Peak Set Point	40.00	41.00	−−	−−	−−	−−	
Th Peak Loc	209.6	210.1	−−	−−	−−	−−	
Th Peak Res	7.000	7.101	−−	−−	−−	−−	%
Background Count Rate	142.5	15.67	−−	−−	−−	−−	CPS
Gain Ratio	1.000	1.010	−−	−−	−−	−−	

Hostile Natural Gamma Ray Sonde Master Calibration − Detector 2 Calibration
Master: 14−Jul−2014 23:07

Na 511 Peak Set Point	40.00	41.00	−−	−−	−−	−−	
Th Peak Loc	209.6	207.2	−−	−−	−−	−−	
Th Peak Res	7.000	7.470	−−	−−	−−	−−	%
Background Count Rate	142.5	15.79	−−	−−	−−	−−	CPS
Gain Ratio	1.000	0.9988	−−	−−	−−	−−	

Enhanced DTS Cartridge Wellsite Calibration − EDTC Accelerometer Calibration
Before: 25−Jul−2014 10:35

EDTC Z−Axis Acceleration	9.810	N/A	9.756	N/A	N/A	N/A	M/S2

Enhanced DTS Cartridge Wellsite Calibration − Detector Calibration
Before: 15−Jul−2014 8:25 After: 15−Jul−2014 8:38

Gamma Ray (Jig − Bkg)	154.0	N/A	154.0	158.6	4.600	14.00	GAPI
Gamma Ray (Calibrated)	164.0	N/A	164.0	168.9	4.899	15.00	GAPI

Accelerator−Porosity Tool − Detector Plateau Settings :

Near Detector Plateau Setting 1696 V
Far Detector Plateau Setting 2035 V
Array Detector Plateau Setting 1940 V

High Resolution Laterolog Array − B / Equipment Identification

Primary Equipment:		
HRLT Sonde	HRLS − B	768
Auxiliary Equipment:		
HRLT lower Housing	HRLH − B	968
HRLT Lower Cartridge	HRLC − B	974
HRLT upper Housing	HRUH − B	978
HRLT Upper Cartridge	HRUC − B	764

High Resolution Laterolog Array − B Wellsite Calibration
HRLT M01

Idx	Phase	HRLT M0−M1 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		−318.6	−322.7	−280.7	−379.7
	After		−318.8			
1	Before		−328.5	−322.7	−280.7	−379.7
	After		−333.5			
2	Before		−331.3	−322.7	−280.7	−379.7
	After		−334.2			

	After	−334.6			
3	Before	−335.4	−322.7	−280.7	−379.7
	After	−338.0			
4	Before	−325.2	−322.7	−280.7	−379.7
	After	−326.2			
5	Before	−321.7	−322.7	−280.7	−379.7
	After	−322.2			
6	Before	320.5	322.7	379.7	280.7
	After	324.6			
7	Before	−322.7	−322.7	−280.7	−379.7
	After	−322.7			
	(Minimum) (Nominal) (Maximum)				

Before: 25−Jul−2014 10:35
After: 25−Jul−2014 16:14

High Resolution Laterolog Array − B Wellsite Calibration
HRLT M12

Idx	Phase	HRLT M1−M2 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		1754	1781	2095	1549
	After		1752			
1	Before		1811	1781	2095	1549
	After		1835			
2	Before		1821	1781	2095	1549
	After		1834			
3	Before		1842	1781	2095	1549
	After		1852			
4	Before		1785	1781	2095	1549
	After		1787			
5	Before		1767	1781	2095	1549
	After		1766			
6	Before		−1776	−1781	−1549	−2095
	After		−1794			
7	Before		1781	1781	2095	1549
	After		1781			
	(Minimum) (Nominal) (Maximum)					

Before: 25−Jul−2014 10:35
After: 25−Jul−2014 16:14

High Resolution Laterolog Array − B Wellsite Calibration
HRLT M23

Idx	Phase	HRLT M2−M3 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		1740	1781	2095	1549
	After		1738			
1	Before		1811	1781	2095	1549
	After		1832			
2	Before		1820	1781	2095	1549
	After		1833			
3	Before		1846	1781	2095	1549
	After					

	After	1854			
4	Before	1782	1781	2095	1549
	After	1783			
5	Before	1764	1781	2095	1549
	After	1763			
6	Before	−1765	−1781	−1549	−2095
	After	−1780			
7	Before	1781	1781	2095	1549
	After	1781			
	(Minimum) (Nominal) (Maximum)				

Before: 25−Jul−2014 10:35

After: 25−Jul−2014 16:14

High Resolution Laterolog Array − B Wellsite Calibration

HRLT V34

Idx	Phase	HRLT A3−A4 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		68350	70000	82360	60900
	After		68360			
1	Before		70890	70000	82360	60900
	After		71850			
2	Before		71590	70000	82360	60900
	After		72170			
3	Before		72820	70000	82360	60900
	After		73280			
4	Before		70290	70000	82360	60900
	After		70440			
5	Before		69610	70000	82360	60900
	After		69660			
6	Before		−68110	−70000	−60900	−82360
	After		−68840			
7	Before		70000	70000	82360	60900
	After		70000			
	(Minimum) (Nominal) (Maximum)					

Before: 25−Jul−2014 10:35

After: 25−Jul−2014 16:14

High Resolution Laterolog Array − B Wellsite Calibration

HRLT V45

Idx	Phase	HRLT A4−A5 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		68630	70000	82360	60900
	After		68640			
1	Before		71280	70000	82360	60900
	After		72230			
2	Before		71930	70000	82360	60900
	After		72530			
3	Before		73150	70000	82360	60900
	After		73630			
4	Before		70590	70000	82360	60900

	After	70740			
5	Before	69890	70000	82360	60900
	After	69950			
6	Before	−68470	−70000	−60900	−82360
	After	−69220			
7	Before	70000	70000	82360	60900
	After	70000			
	(Minimum) (Nominal) (Maximum)				

Before: 25−Jul−2014 10:35

After: 25−Jul−2014 16:14

High Resolution Laterolog Array − B Wellsite Calibration

HRLT V56

Idx	Phase	HRLT A5−A6 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		68530	70000	82360	60900
	After		68540			
1	Before		71010	70000	82360	60900
	After		71950			
2	Before		71710	70000	82360	60900
	After		72290			
3	Before		72970	70000	82360	60900
	After		73430			
4	Before		70440	70000	82360	60900
	After		70590			
5	Before		69770	70000	82360	60900
	After		69830			
6	Before		−68200	−70000	−60900	−82360
	After		−68930			
7	Before		70000	70000	82360	60900
	After		70000			
	(Minimum) (Nominal) (Maximum)					

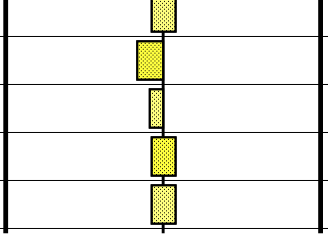
Before: 25−Jul−2014 10:35

After: 25−Jul−2014 16:14

High Resolution Laterolog Array − B Wellsite Calibration

HRLT VTP

Idx	Phase	HRLT Torpedo−M0 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		−68200	−70000	−60900	−82360
	After		−68220			
1	Before		−71320	−70000	−60900	−82360
	After		−72290			
2	Before		−72000	−70000	−60900	−82360
	After		−72610			
3	Before		−73260	−70000	−60900	−82360
	After		−73720			
4	Before		−70650	−70000	−60900	−82360
	After		−70810			
5	Before		−69940	−70000	−60900	−82360

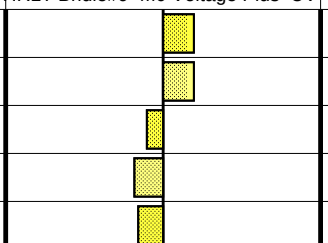
	After		−69980			
6	Before		68460	70000	82360	60900
	After		69200			
7	Before		−70000	−70000	−60900	−82360
	After		−70000			
	(Minimum) (Nominal) (Maximum)					

Before: 25−Jul−2014 10:35

After: 25−Jul−2014 16:14

High Resolution Laterolog Array − B Wellsite Calibration

HRLT VBD

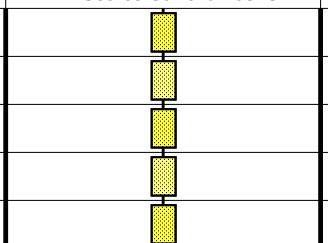
Idx	Phase	HRLT Bridle#9−M0 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		−68200	−70000	−60900	−82360
	After		−68210			
1	Before		−71290	−70000	−60900	−82360
	After		−72260			
2	Before		−71970	−70000	−60900	−82360
	After		−72590			
3	Before		−73230	−70000	−60900	−82360
	After		−73700			
4	Before		−70640	−70000	−60900	−82360
	After		−70790			
5	Before		−69920	−70000	−60900	−82360
	After		−69980			
6	Before		68440	70000	82360	60900
	After		69180			
7	Before		−70000	−70000	−60900	−82360
	After		−70000			
	(Minimum) (Nominal) (Maximum)					

Before: 25−Jul−2014 10:35

After: 25−Jul−2014 16:14

High Resolution Laterolog Array − B Wellsite Calibration

HRLT ISO

Idx	Phase	HRLT Source Current Plus UA	Value	Nominal	Maximum	Minimum
0	Before		284.4	284.0	334.1	247.0
	After		284.4			
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	Before		281.1	281.1	330.7	244.4
	After		281.1			
6	Before		281.1	281.1	330.7	244.4

	After		281.1		
7	Before		281.1	281.1	330.7	244.4
	After		281.1			
	(Minimum)	(Nominal)	(Maximum)			

Before: 25−Jul−2014 10:35

After: 25−Jul−2014 16:14

High Resolution Laterolog Array − B Wellsite Calibration

HRLT MV

Idx	Phase	HRLT Vertical Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		−321.4	−322.7	−280.7	−379.7
	After		−321.1			
1	Before		−323.9	−322.7	−280.7	−379.7
	After		−328.1			
2	Before		−325.7	−322.7	−280.7	−379.7
	After		−328.0			
3	Before		−327.8	−322.7	−280.7	−379.7
	After		−329.6			
4	Before		−314.8	−322.7	−280.7	−379.7
	After		−315.2			
5	Before		−326.4	−322.7	−280.7	−379.7
	After		−326.4			
6	Before		328.9	322.7	379.7	280.7
	After		332.2			
7	**Before**		**−322.7**	−322.7	−280.7	−379.7
	After		−322.7			
	(Minimum)	(Nominal)	(Maximum)			

Before: 25−Jul−2014 10:35

After: 25−Jul−2014 16:14

Hostile Litho−Density Sonde / Equipment Identification

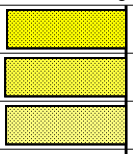
Primary Equipment:		
Hostile Litho Density Sonde	HLDS − D	45
Hostile Litho Density High Voltage	HLDV − D	45
Gamma Source Radioactive	GSR − Z	8113
Auxiliary Equipment:		
Hostile Litho Density Pad	HLDP − C	45
Hostile Litho Density High Voltage Housi	HEH − H	47

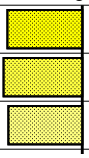
Hostile Litho−Density Sonde Wellsite Calibration

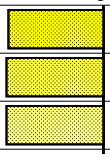
Background Measurement

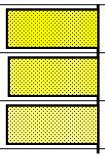
Phase	SS Cs Resolution Bkg %	Value	Phase	LS Cs Resolution Bkg %	Value	Phase	LSW1 Background CPS	Value
Master		8.061	Master		8.137	Master		69.74
Before		8.076	Before		8.180	Before		68.24
After		7.968	After		8.175	After		70.48
	7.000 (Minimum) 9.000 (Nominal) 11.00 (Maximum)			7.000 (Minimum) 9.000 (Nominal) 11.00 (Maximum)			55.00 (Minimum) 100.0 (Nominal) 150.0 (Maximum)	

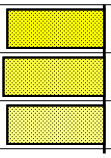
Phase	LSW2 Background CPS	Value	Phase	LSW3 Background CPS	Value	Phase	LSW4 Background CPS	Value
Master		63.61	Master		141.8	Master		172.4
Before		64.16	Before		137.9	Before		171.0
After		63.74	After		141.1	After		170.7

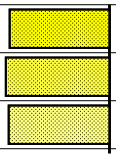
Phase	LSW5 Background CPS	Value
Master		395.0
Before		391.5
After		393.4
	330.0 (Minimum) 600.0 (Nominal) 830.0 (Maximum)	

Phase	SSW1 Background CPS	Value
Master		78.54
Before		77.29
After		78.86
	55.00 (Minimum) 100.0 (Nominal) 150.0 (Maximum)	

Phase	SSW2 Background CPS	Value
Master		139.1
Before		138.0
After		138.2
	100.0 (Minimum) 200.0 (Nominal) 260.0 (Maximum)	

Phase	SSW3 Background CPS	Value
Master		371.9
Before		374.7
After		371.5
	280.0 (Minimum) 500.0 (Nominal) 700.0 (Maximum)	

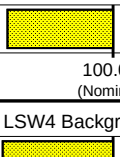
Phase	SSW4 Background CPS	Value
Master		195.4
Before		192.7
After		195.5
	150.0 (Minimum) 270.0 (Nominal) 380.0 (Maximum)	

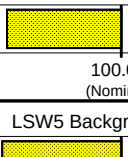
Phase	SSW5 Background CPS	Value
Master		142.5
Before		140.4
After		142.0
	110.0 (Minimum) 200.0 (Nominal) 270.0 (Maximum)	

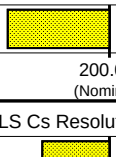
Master: 16−Jul−2014 4:36 Before: 17−Jul−2014 5:36 After: 17−Jul−2014 5:45

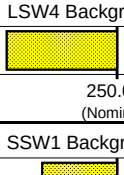
Hostile Litho−Density Sonde Master Calibration

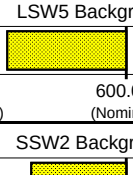
Detector Background Measurement

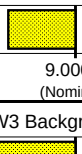
Phase	LSW1 Background CPS	Value
Master		69.74
	55.00 (Minimum) 100.0 (Nominal) 150.0 (Maximum)	

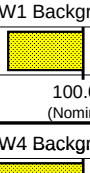
Phase	LSW2 Background CPS	Value
Master		63.61
	50.00 (Minimum) 100.0 (Nominal) 140.0 (Maximum)	

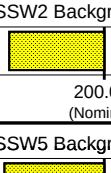
Phase	LSW3 Background CPS	Value
Master		141.8
	110.0 (Minimum) 200.0 (Nominal) 290.0 (Maximum)	

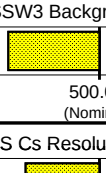
Phase	LSW4 Background CPS	Value
Master		172.4
	140.0 (Minimum) 250.0 (Nominal) 360.0 (Maximum)	

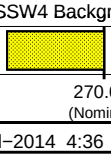
Phase	LSW5 Background CPS	Value
Master		395.0
	330.0 (Minimum) 600.0 (Nominal) 830.0 (Maximum)	

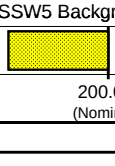
Phase	LS Cs Resolution Bkg %	Value
Master		8.137
	7.000 (Minimum) 9.000 (Nominal) 11.00 (Maximum)	

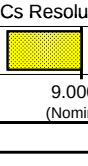
Phase	SSW1 Background CPS	Value
Master		78.54
	55.00 (Minimum) 100.0 (Nominal) 150.0 (Maximum)	

Phase	SSW2 Background CPS	Value
Master		139.1
	100.0 (Minimum) 200.0 (Nominal) 260.0 (Maximum)	

Phase	SSW3 Background CPS	Value
Master		371.9
	280.0 (Minimum) 500.0 (Nominal) 700.0 (Maximum)	

Phase	SSW4 Background CPS	Value
Master		195.4
	150.0 (Minimum) 270.0 (Nominal) 380.0 (Maximum)	

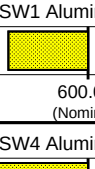
Phase	SSW5 Background CPS	Value
Master		142.5
	110.0 (Minimum) 200.0 (Nominal) 270.0 (Maximum)	

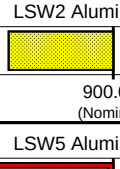
Phase	SS Cs Resolution Bkg %	Value
Master		8.061
	7.000 (Minimum) 9.000 (Nominal) 11.00 (Maximum)	

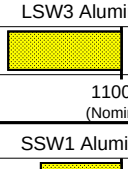
Master: 16−Jul−2014 4:36

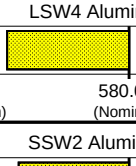
Hostile Litho−Density Sonde Master Calibration

Detector Aluminum Measurement (bkgd−subtracted)

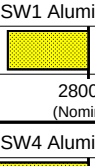
Phase	LSW1 Aluminum CPS	Value
Master		508.4
	420.0 (Minimum) 600.0 (Nominal) 770.0 (Maximum)	

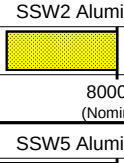
Phase	LSW2 Aluminum CPS	Value
Master		733.7
	650.0 (Minimum) 900.0 (Nominal) 1150 (Maximum)	

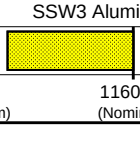
Phase	LSW3 Aluminum CPS	Value
Master		883.4
	800.0 (Minimum) 1100 (Nominal) 1450 (Maximum)	

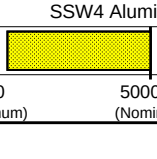
Phase	LSW4 Aluminum CPS	Value
Master		447.4
	410.0 (Minimum) 580.0 (Nominal) 740.0 (Maximum)	

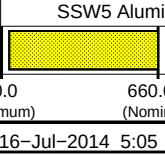
Phase	LSW5 Aluminum CPS	Value
Master	EXCEEDS LIMIT	407.5
	410.0 (Minimum) 570.0 (Nominal) 740.0 (Maximum)	

Phase	SSW1 Aluminum CPS	Value
Master		2389
	2000 (Minimum) 2800 (Nominal) 3200 (Maximum)	

Phase	SSW2 Aluminum CPS	Value
Master		6455
	5800 (Minimum) 8000 (Nominal) 9300 (Maximum)	

Phase	SSW3 Aluminum CPS	Value
Master		8951
	8300 (Minimum) 11600 (Nominal) 13500 (Maximum)	

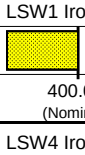
Phase	SSW4 Aluminum CPS	Value
Master		3637
	3500 (Minimum) 5000 (Nominal) 5800 (Maximum)	

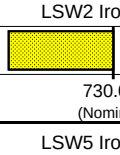
Phase	SSW5 Aluminum CPS	Value
Master		442.1
	430.0 (Minimum) 660.0 (Nominal) 770.0 (Maximum)	

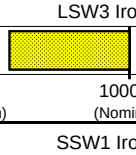
Master: 16−Jul−2014 5:05

Hostile Litho−Density Sonde Master Calibration

Detector Litholog Measurement (bkgd−subtracted)

Phase	LSW1 Iron CPS	Value
Master		349.8
	290.0 (Minimum) 400.0 (Nominal) 560.0 (Maximum)	

Phase	LSW2 Iron CPS	Value
Master		590.1
	520.0 (Minimum) 730.0 (Nominal) 950.0 (Maximum)	

Phase	LSW3 Iron CPS	Value
Master		785.3
	720.0 (Minimum) 1000 (Nominal) 1350 (Maximum)	

Phase	LSW4 Iron CPS	Value

Phase	LSW5 Iron CPS	Value

Phase	SSW1 Iron CPS	Value

Phase		Value
Master		408.9
	370.0 (Minimum) 520.0 (Nominal) 700.0 (Maximum)	

Phase		Value
Master		376.5
	340.0 (Minimum) 470.0 (Nominal) 750.0 (Maximum)	

Phase		Value
Master		1743
	1500 (Minimum) 2100 (Nominal) 2400 (Maximum)	

Phase	SSW2 Iron CPS	Value
Master		5378
	4900 (Minimum) 6800 (Nominal) 7900 (Maximum)	

Phase	SSW3 Iron CPS	Value
Master		8163
	7800 (Minimum) 10800 (Nominal) 12600 (Maximum)	

Phase	SSW4 Iron CPS	Value
Master		3323
	3300 (Minimum) 4600 (Nominal) 5400 (Maximum)	

Phase	SSW5 Iron CPS	Value
Master	EXCEEDS LIMIT	390.1
	420.0 (Minimum) 580.0 (Nominal) 680.0 (Maximum)	

Master: 16−Jul−2014 4:57

Hostile Litho−Density Sonde Master Calibration

Quality Ratios

Phase	AL CALIBRATION RATIO 1	Value
Master		1.033
	0.9000 (Minimum) 1.000 (Nominal) 1.100 (Maximum)	

Phase	AL CALIBRATION RATIO 2	Value
Master		2.194
	1.900 (Minimum) 2.100 (Nominal) 2.300 (Maximum)	

Phase	AL CALIBRATION RATIO 3	Value
Master		0.5947
	0.4500 (Minimum) 0.5500 (Nominal) 0.6500 (Maximum)	

Phase	AL CALIBRATION RATIO 4	Value
Master		0.5857
	0.4000 (Minimum) 0.5500 (Nominal) 0.6500 (Maximum)	

Phase	Pad−Wear SS Ratio	Value
Master		0.9884
	0.9800 (Minimum) 0.9880 (Nominal) 0.9960 (Maximum)	

Phase	Pad−Wear LS Ratio	Value
Master	EXCEEDS LIMIT	0.9786
	0.9800 (Minimum) 0.9880 (Nominal) 0.9960 (Maximum)	

Phase	Pad−Position SS Ratio	Value
Master		0.9978
	0.9900 (Minimum) 0.9940 (Nominal) 1.015 (Maximum)	

Phase	Pad−Position LS Ratio	Value
Master		0.9850
	0.9850 (Minimum) 0.9940 (Nominal) 1.010 (Maximum)	

Master: 16−Jul−2014 4:51

Litho−Density Spectroscopy Cartridge − B / Equipment Identification

Primary Equipment:		
LDSC Cartridge	LDSC − B	521
Auxiliary Equipment:		
LDSC Housing	LDSH − A	319

Accelerator−Porosity Tool / Equipment Identification

Primary Equipment:		
Accelerator−Porosity Sonde	APS − C	212
APS Minitron	MNTR − F	6504
Auxiliary Equipment:		
Accelerator−Porosity Housing	APH − AC	121
APS Calibration Water Tank	SFT − 178	1
APS Aluminum Calibrator Sleeve	SFT − 281	1

Accelerator−Porosity Tool Wellsite Calibration

Detector Background

Phase	Near Det Bkg Cntrate CPS	Value
Master		26.61
Before		25.31
After		24.64
	1.000 (Minimum) 30.00 (Nominal) 50.00 (Maximum)	

Phase	Far Det Bkg Cntrate CPS	Value
Master		29.50
Before		28.75
After		28.13
	1.000 (Minimum) 30.00 (Nominal) 50.00 (Maximum)	

Phase	Array−1 Det Bkg Cntrate CPS	Value
Master		26.43
Before		27.75
After		25.53
	1.000 (Minimum) 30.00 (Nominal) 50.00 (Maximum)	

Phase	Array−2 Det Bkg Cntrate CPS	Value
Master		26.28
Before		25.33
After		26.88
	1.000 (Minimum) 30.00 (Nominal) 50.00 (Maximum)	

Phase	Array Therm Det Bkg Cntrate CPS	Value
Master		26.35
Before		26.69
After		28.83
	1.000 (Minimum) 30.00 (Nominal) 50.00 (Maximum)	

Master: 16−Jul−2014 2:13 Before: 25−Jul−2014 10:41 After: 25−Jul−2014 16:17

Accelerator−Porosity Tool Wellsite Calibration

Calibration Ratios

Phase	Near/Far Calibration Ratio	Value	Phase	Near/Array Calibration Ratio	Value	Phase	Near/Array Cal Ratio Up/Down	Value
Master		0.9745	Master		1.083	Master		1.014
	0.8000 (Minimum) 0.9250 (Nominal) 1.050 (Maximum)			0.9000 (Minimum) 1.030 (Nominal) 1.170 (Maximum)			0.9700 (Minimum) 1.000 (Nominal) 1.030 (Maximum)	

Master: 16−Jul−2014 2:16

Accelerator−Porosity Tool Wellsite Calibration

Tank Check

Phase	Array−1 Standoff Porosity PU	Value	Phase	Array−2 Standoff Porosity PU	Value	Phase	Average Slowing Down Time US	Value
Master		10.47	Master		10.65	Master		6.035
	9.900 (Minimum) 11.75 (Nominal) 13.60 (Maximum)			9.900 (Minimum) 11.75 (Nominal) 13.60 (Maximum)			5.500 (Minimum) 6.000 (Nominal) 6.250 (Maximum)	
Phase	Array−1 SDT Ratio Up/Down	Value	Phase	Array−2 SDT Ratio Up/Down	Value	Phase	Sigma Formation CU	Value
Master		0.9776	Master		0.9742	Master		33.77
	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)			0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)			20.00 (Minimum) 27.50 (Nominal) 35.00 (Maximum)	

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Accelerator−Porosity Tool Master Calibration

Detector Calibration

Phase	Near/Far Calibration Ratio	Value	Phase	Near/Array Calibration Ratio	Value	Phase	Near/Array Cal Ratio Up/Down	Value
Master		0.9745	Master		1.083	Master		1.014
	0.8000 (Minimum) 0.9250 (Nominal) 1.050 (Maximum)			0.9000 (Minimum) 1.030 (Nominal) 1.170 (Maximum)			0.9700 (Minimum) 1.000 (Nominal) 1.030 (Maximum)	

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Accelerator−Porosity Tool Master Calibration

Tank Check

Phase	Array−1 Standoff Porosity PU	Value	Phase	Array−2 Standoff Porosity PU	Value	Phase	Average Slowing Down Time US	Value
Master		10.47	Master		10.65	Master		6.035
	9.900 (Minimum) 11.75 (Nominal) 13.60 (Maximum)			9.900 (Minimum) 11.75 (Nominal) 13.60 (Maximum)			5.500 (Minimum) 6.000 (Nominal) 6.250 (Maximum)	
Phase	Array−1 SDT Ratio Up/Down	Value	Phase	Array−2 SDT Ratio Up/Down	Value	Phase	Sigma Formation CU	Value
Master		0.9776	Master		0.9742	Master		33.77
	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)			0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)			20.00 (Minimum) 27.50 (Nominal) 35.00 (Maximum)	

Master: 16−Jul−2014 2:16

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

Hostile Natural Gamma Ray Sonde Wellsite Calibration

Detector 1 Check

Phase	Na 511 Peak Loc	Value	Phase	Na 511 Peak Res %	Value	Phase	High Voltage V	Value
Master		39.57	Master		15.78	Master		1197

Phase	Value
Before	39.75
After	39.77

37.50 (Minimum) 40.00 (Nominal) 43.50 (Maximum)

Phase	Value
Before	15.47
After	15.60

12.00 (Minimum) 15.50 (Nominal) 19.00 (Maximum)

Phase	Value
Before	1198
After	1197

900.0 (Minimum) 1150 (Nominal) 1600 (Maximum)

Phase	Na 1785 Peak Loc	Value
Master		142.4
Before		143.3
After		142.8

135.0 (Minimum) 142.6 (Nominal) 150.3 (Maximum)

Phase	Na 1785 Peak Res %	Value
Master		9.334
Before		9.234
After		8.659

7.000 (Minimum) 8.500 (Nominal) 11.00 (Maximum)

Phase	Temperature DEGC	Value
Master		37.42
Before		37.47
After		37.56

−28.89 (Minimum) 15.50 (Nominal) 60.00 (Maximum)

Phase	Na Count Rate CPS	Value
Master		10.91
Before		10.93
After		10.90

10.00 (Minimum) 45.00 (Nominal) 100.0 (Maximum)

Master: 15−Jul−2014 0:16 Before: 15−Jul−2014 8:28 After: 15−Jul−2014 8:42

Hostile Natural Gamma Ray Sonde Wellsite Calibration

Detector 2 Check

Phase	Na 511 Peak Loc	Value
Master		39.46
Before		39.66
After		39.81

37.50 (Minimum) 40.00 (Nominal) 43.50 (Maximum)

Phase	Na 511 Peak Res %	Value
Master		16.20
Before		15.73
After		15.53

12.00 (Minimum) 15.50 (Nominal) 19.00 (Maximum)

Phase	High Voltage V	Value
Master		1129
Before		1129
After		1130

900.0 (Minimum) 1150 (Nominal) 1600 (Maximum)

Phase	Na 1785 Peak Loc	Value
Master		141.8
Before		**140.1**
After		143.7

135.0 (Minimum) 142.6 (Nominal) 150.3 (Maximum)

Phase	Na 1785 Peak Res %	Value
Master		10.06
Before		**10.03**
After		8.567

7.000 (Minimum) 8.500 (Nominal) 11.00 (Maximum)

Phase	Temperature DEGC	Value
Master		38.37
Before		**38.33**
After		38.34

−28.89 (Minimum) 15.50 (Nominal) 60.00 (Maximum)

Phase	Na Count Rate CPS	Value
Master		11.54
Before		11.55
After		11.30

10.00 (Minimum) 45.00 (Nominal) 100.0 (Maximum)

Master: 15−Jul−2014 0:16 Before: 15−Jul−2014 8:28 After: 15−Jul−2014 8:42

Hostile Natural Gamma Ray Sonde Wellsite Calibration

Ratio Of Detector 1 To Detector 2

Phase	Coincidence Count Rate Ratio	Value
Master	EXCEEDS LIMIT	0.9495
Before		0.9508
After		0.9685

0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)

Master: 15−Jul−2014 0:16
Before: 15−Jul−2014 8:28
After: 15−Jul−2014 8:42

Hostile Natural Gamma Ray Sonde Master Calibration

Detector 1 Calibration

Phase	Na 511 Peak Set Point	Value
Master		41.00

38.00 (Minimum) 40.00 (Nominal) 43.00 (Maximum)

Phase	Th Peak Loc	Value
Master		210.1

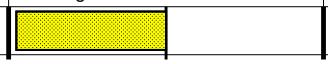
201.0 (Minimum) 209.6 (Nominal) 218.3 (Maximum)

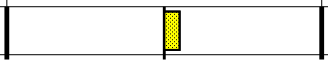
Phase	Th Peak Res %	Value
Master		7.101

5.000 (Minimum) 7.000 (Nominal) 9.000 (Maximum)

Phase	Background Count Rate CPS	Value

Phase	Gain Ratio	Value

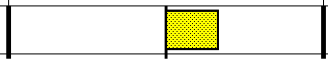
Phase		Value
Master		15.67
	10.00 (Minimum) 142.5 (Nominal) 265.0 (Maximum)	

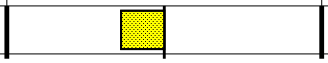
Phase		Value
Master		1.010
	0.9400 (Minimum) 1.000 (Nominal) 1.060 (Maximum)	

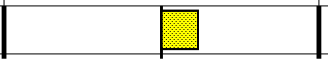
Master: 14−Jul−2014 23:07

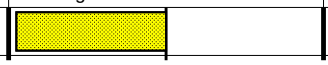
Hostile Natural Gamma Ray Sonde Master Calibration

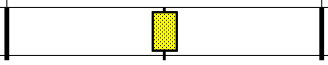
Detector 2 Calibration

Phase	Na 511 Peak Set Point	Value
Master		41.00
	38.00 (Minimum) 40.00 (Nominal) 43.00 (Maximum)	

Phase	Th Peak Loc	Value
Master		207.2
	201.0 (Minimum) 209.6 (Nominal) 218.3 (Maximum)	

Phase	Th Peak Res %	Value
Master		7.470
	5.000 (Minimum) 7.000 (Nominal) 9.000 (Maximum)	

Phase	Background Count Rate CPS	Value
Master		15.79
	10.00 (Minimum) 142.5 (Nominal) 265.0 (Maximum)	

Phase	Gain Ratio	Value
Master		0.9988
	0.9400 (Minimum) 1.000 (Nominal) 1.060 (Maximum)	

Master: 14−Jul−2014 23:07

Enhanced DTS Cartridge / Equipment Identification

Primary Equipment:		
EDTC Gamma Ray Detector	EDTG − A/B	8305
Enhanced DTS Cartridge	EDTC − B	8317
Auxiliary Equipment:		
EDTC Housing	EDTH − B	8303

Enhanced DTS Cartridge Wellsite Calibration

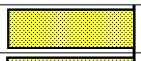
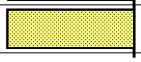
EDTC Accelerometer Calibration

Phase	EDTC Z−Axis Acceleration M/S2	Value
Before		9.756
	9.610 (Minimum) 9.810 (Nominal) 10.01 (Maximum)	

Before: 25−Jul−2014 10:35

Enhanced DTS Cartridge Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value
Before		6.019
After		5.723
	0 (Minimum) 30.00 (Nominal) 120.0 (Maximum)	

Phase	Gamma Ray (Jig − Bkg) GAPI	Value
Before		154.0
After		158.6
	140.0 (Minimum) 154.0 (Nominal) 168.0 (Maximum)	

Phase	Gamma Ray (Calibrated) GAPI	Value
Before		164.0
After		168.9
	149.0 (Minimum) 164.0 (Nominal) 179.0 (Maximum)	

Before: 15−Jul−2014 8:25 After: 15−Jul−2014 8:38

Company: **Lamont Doherty Earth Observatory**

Schlumberger

Well: **Expedition 351, Site U1438F**
Field: **IBM Arc Origins**
Rig: **JOIDES Resolution**
Ocean: **Pacific**

Hostile Natural Gamma Sonde (HNGS)
High Resolution Laterolog Array (HRLA)
HLDS/APS Density/Porosity

HLDS/APS Density/Porosity