



COMPENSATED Z-DENSILOGSM
COMPENSATED NEUTRON LOG
GAMMA RAY LOGSM
TTRM SUB

FILE NO: MD11798	COMPANY HOLLY FRONTIER - NAVAJO
API NO: 30-015-44677	WELL NAVAJO REFINING WDW #4
	FIELD ARTESIA
	COUNTY EDDY
	STATE NEW MEXICO

Ver. 4.10	LOCATION: 1217' FSL & 2443' FWL SECTION 23, T17S, R27E N.M.P.M. SURVEY	OTHER SERVICES STAR
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PERMANENT DATUM	GL	ELEVATION	3565.8 FT	ELEVATIONS:
LOG MEASURED FROM	KB	20 FT	ABOVE P.D.	KB 3565.8 FT
DRILL. MEAS. FROM	KB			DF 3584.8 FT
				GL 3565.8 FT

DATE	16-JUN-2018		29-JUN-2018	
RUN	TRIP	2	1	3
SERVICE ORDER		134536		134542
DEPTH DRILLER		9739 FT		10360 FT
DEPTH LOGGER		9740 FT		10360 FT
BOTTOM LOGGED INTERVAL		9740 FT		10360 FT
TOP LOGGED INTERVAL		1680 FT		9740 FT
CASING DRILLER		13.375 IN	@ 1680 FT	13.375 IN @ 1680 FT
CASING LOGGER		1680 FT		1680 FT
BIT SIZE		12.25 IN		12.25 IN
TYPE OF FLUID IN HOLE		WBM		WBM
DENSITY	VISCOSITY	9.8 LB/G	46 CP	9.7 LB/G
PH	FLUID LOSS	10	N/A	10
SOURCE OF SAMPLE		FLOWLINE		FLOWLINE
RM AT MEAS. TEMP.		0.036 OHMM	@ 75 DEGF	0.091 OHMM @ 75 DEGF
RMF AT MEAS. TEMP.		0.031 OHMM	@ 75 DEGF	0.077 OHMM @ 75 DEGF
RMC AT MEAS. TEMP.		0.048 OHMM	@ 75 DEGF	0.122 OHMM @ 75 DEGF
SOURCE OF RMF	RMC	MEASURED	MEASURED	MEASURED
RM AT BHT		0.066 OHMM	@ 132 DEGF	0.193 OHMM @ 167 DEGF
TIME SINCE CIRCULATION		8 HRS		9 HRS
MAX. RECORDED TEMP.		135 DEGF		168 DEGF
EQUIP. NO.	LOCATION	HL6845	MIDLAND, TX	HL6690
RECORDED BY		JKOSKI		JKOSKI
WITNESSED BY		RCOOK		KCOOK

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE THE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT. BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

REMARKS

RUN 2 TRIP 1: DATA TIED INTO RUN 1 DATA

BOREHOLE AND CEMENT VOLUME PRESENTED (TOTAL VOLUME LESS 9.625" CASING)
1 SMALL TICK = 10 CUBIC FEET
1 MEDIUM TICK = 100 CUBIC FEET
1 LARGE TICK = 1000 CUBIC FEET

PORZC AND CNC RECORDED AND PRESENTED ON A LIMESTONE MATRIX
CNC IS CALIPER AND CASING CORRECTED

RIG: PATRIOT #4
CREW: J. ESPINOZA / R. SANCHEZ

RUN 3 TRIP 1: DATA TIED INTO RUN 2 DATA

BOREHOLE AND CEMENT VOLUME PRESENTED (TOTAL VOLUME LESS THAN 9.625" CASING)
1 SMALL TICK = 10 CU. FT
1 MEDIUM TICK = 100 CU. FT
1 LARGE TICK = 1000 CU. FT

PORZC & CNC RECORDED ON A LIMESTONE MATRIX
CNC IS CASING AND CALIPER CORRECTED

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	TTRM	3981XA	10570248	FREE
1	1	COMM	3514XA	Z173226	FREE
1	1	GAMMA	1329XA	Z179409	D.CENT
1	1	CN	2446XA	Z154181	D.CENT
1	1	ZDL	2234XA	10495292	PAD DEVICE
1	1	DBL KNUCK	3939XA	10335551	FREE
1	1	6CAL	4243XA	12408673	CENTRALIZED
1	1	RTEX	1249XA	12554838	CENTRALIZED
1	1	MLL	1243XA	13647991	PAD DEVICE

INSTRUMENT CONFIGURATION

Source File: /dat1a/md11798R3/p87cc~wsp-tdg

CABLEHEAD

Diameter : 3.38"
Length : 5.50'
Weight : 24 lbs
Series : CABL338
Mnemonic : CBLH
Volume Disp. : 9.7 L

TTRM SUB

Diameter : 3.63"
Length : 3.83'
Weight : 62 lbs
Series : 3981XA
Mnemonic : TTRM

WTS COMMON REMOTE

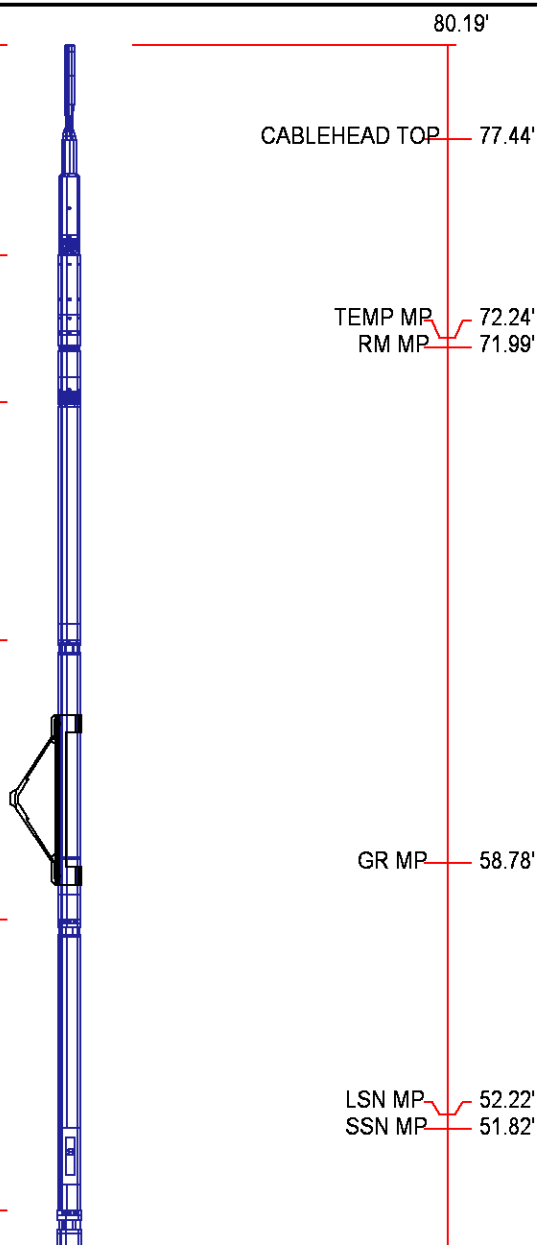
Diameter : 3.63"
Length : 6.36'
Weight : 126 lbs
Series : 3514XB
Mnemonic : WTS
Volume Disp. : 13.0 L

DIGITAL SPECTRALOG

Diameter : 3.63"
Length : 7.31'
Weight : 130 lbs
Series : 1329XA
Mnemonic : DSL
Volume Disp. : 14.9 L
Measure Point: 1.60': GR MP

COMPENSATED NEUTRON

Diameter : 3.63"
Length : 7.59'
Weight : 150 lbs
Series : 2446XA
Mnemonic : CN
Volume Disp. : 15.4 L
Measure Point: 2.63': LSN MP
Measure Point: 2.24': SSN MP



Z-DENSILOG

Diameter : 4.88"
Length : 11.22'
Weight : 360 lbs
Series : 2234XA
Mnemonic : ZDL
Volume Disp.: 41.3 L
Measure Point: 3.19': CAL MP
Measure Point: 2.47': LSD MP
Measure Point: 2.07': SSD MP

CAL MP 41.56'
LSD MP 40.84'
SSD MP 40.44'

MASS ISOLATION SUB

Diameter : 3.63"
Length : 2.09'

KNUCKLE JOINT (DOUBLE)

Diameter : 3.38"
Length : 4.65'
Weight : 90 lbs
Series : 3939XA
Mnemonic : KNJT

4 ARM BOW SPRING CENTRALIZER

Diameter : 3.38"
Length : 4.12'
Weight : 72 lbs
Series : 4341XA
Mnemonic : CENT

WTS RT EXPLORER

Diameter : 4.00"
Length : 14.00'
Weight : 246 lbs
Series : 1249XA
Mnemonic : RTEX
Volume Disp.: 34.6 L
Measure Point: 7.09': RTEX MP

RTEX MP 20.60'

WTS MICROLATEROLOG

Diameter : 4.00"
Length : 11.25'
Weight : 258 lbs
Series : 1243XA
Mnemonic : MLL
Volume Disp.: 27.8 L
Measure Point: 1.55': MP

MP 3.82'

MASS ISOLATION SUB

Diameter : 3.63"
Length : 2.09'

BULL PLUG 2 5/8

0.00'

TOTAL LENGTH: 80.19'
TOTAL WEIGHT: 1642 lbs
MAX DIAMETER: 0'4.88"
TOTAL VOLUME DISPLACEMENT: 188.4 L (1.2 bbl) Est.

MAIN LOG 2"/100FT SCALE

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017
 Updates: 32 Patches: 4

Plotted: Fri Jun 29 10:50:48 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/md11798R3/p87cc03.prm
 LOGGING MODE: DEPTH DIRECTION: UP
 TOP DEPTH: 9691.591 ft BOTTOM DEPTH: 9691.591 ft

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
TENSION	FILTER ()	medium (1)		TOP	BOTTOM
GR	FILTER ()	medium (1)		"	"
CN	FILTER ()	medium (1)		"	"
CALIPER	FILTER ()	medium (1)		"	"
ZDL MED RES	FILTER (hrd1*)	medium		"	"
	FILTER (hrd1s*)	medium		"	"
	FILTER (hrd2*)	medium		"	"
	FILTER (hrd2s*)	medium		"	"

BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	9.625	in	TOP	BOTTOM
	CASING THICKNESS	0.000	in	"	"
X-Y COMBINED CALIPER PROCESSING	X-Y Caliper	X-Axis		"	"
BIT SIZE	BIT SIZE	12.250	in	"	"
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (zdbh*)	USE CALIPER		"	"
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	12.250	in	"	"

CN PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
2446 CN MATRIX	2446 MATRIX	LIMESTONE		TOP	BOTTOM
CN SALINITY CORRECTION	SALINITY CORR (2446)	SALINITY OFF		"	"
	SALINITY	0	ppm	"	"
CN TOOL STANDOFF	ENABLE STANDOFF CORR	OFF		"	"
	STANDOFF AMOUNT	0.00	in	"	"
CN CASING & CEMENT CORRECTION	CORRECTION	OFF		"	"
	BIT SIZE BEHIND CSNG	7.875	in	"	"

ZDL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
MUD DENSITY	MUD DENSITY	9.80	lbm/gal	TOP	BOTTOM
ZDL	DENX TRACKING	ON		"	"
TRACKING TIME	Logging Spd for Gain	Over 10 ft/min		"	"

CURVE DESCRIPTION REPORT

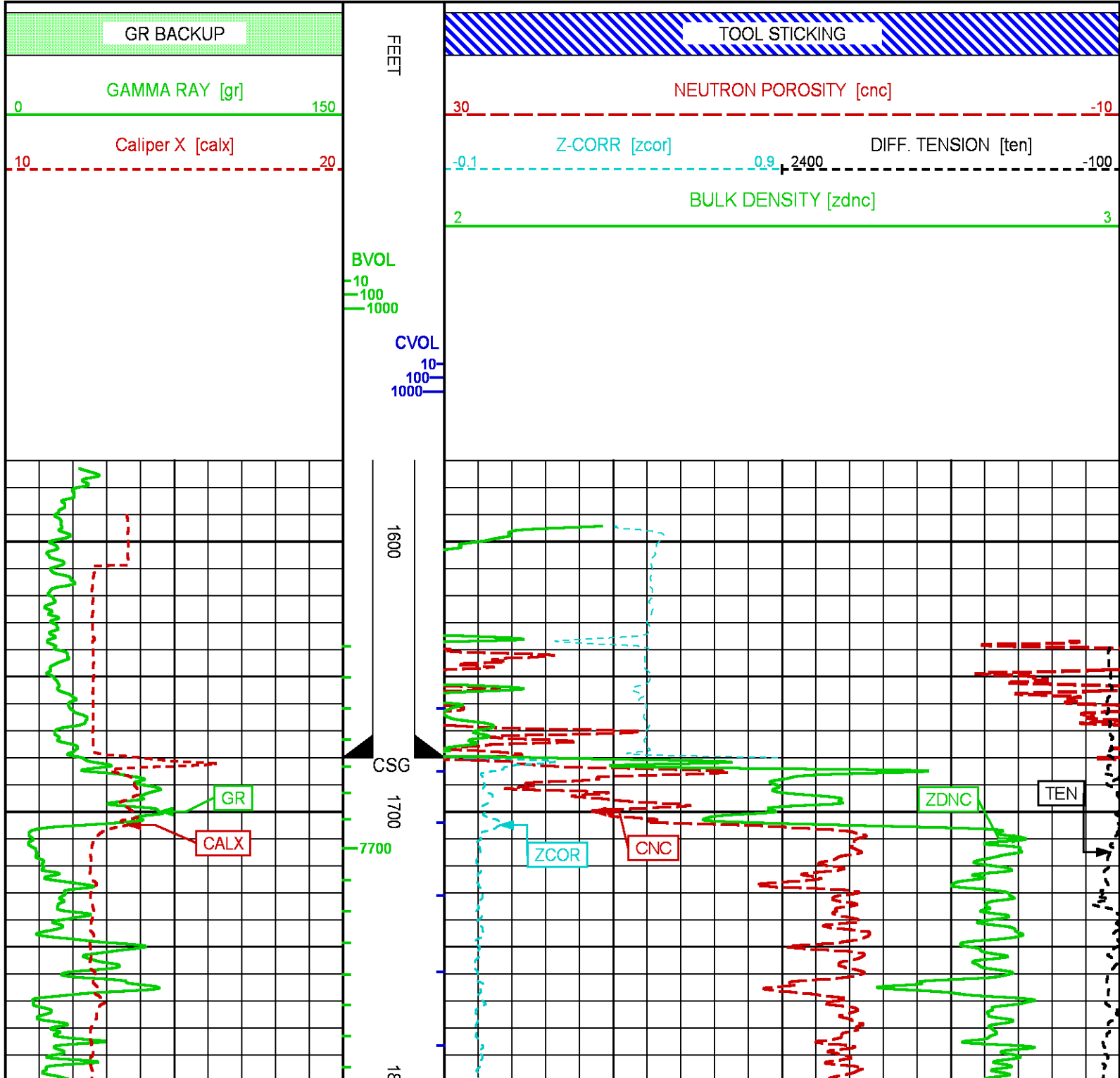
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BVOL	N/A	BOREHOLE VOLUME
F1:CALX	N/A	CALIPER FROM X-AXIS OF XY CALIPER(S)
F1:CNC	N/A	BOREHOLE SIZE CORRECTED COMPENSATED NEUTRON POROSITY
F1:CVOL	N/A	CEMENT VOLUME
F1:GR	N/A	GAMMA RAY
F1:TEN	N/A	DIFFERENTIAL TENSION
F1:ZCOR	N/A	DENSITY CORRECTION

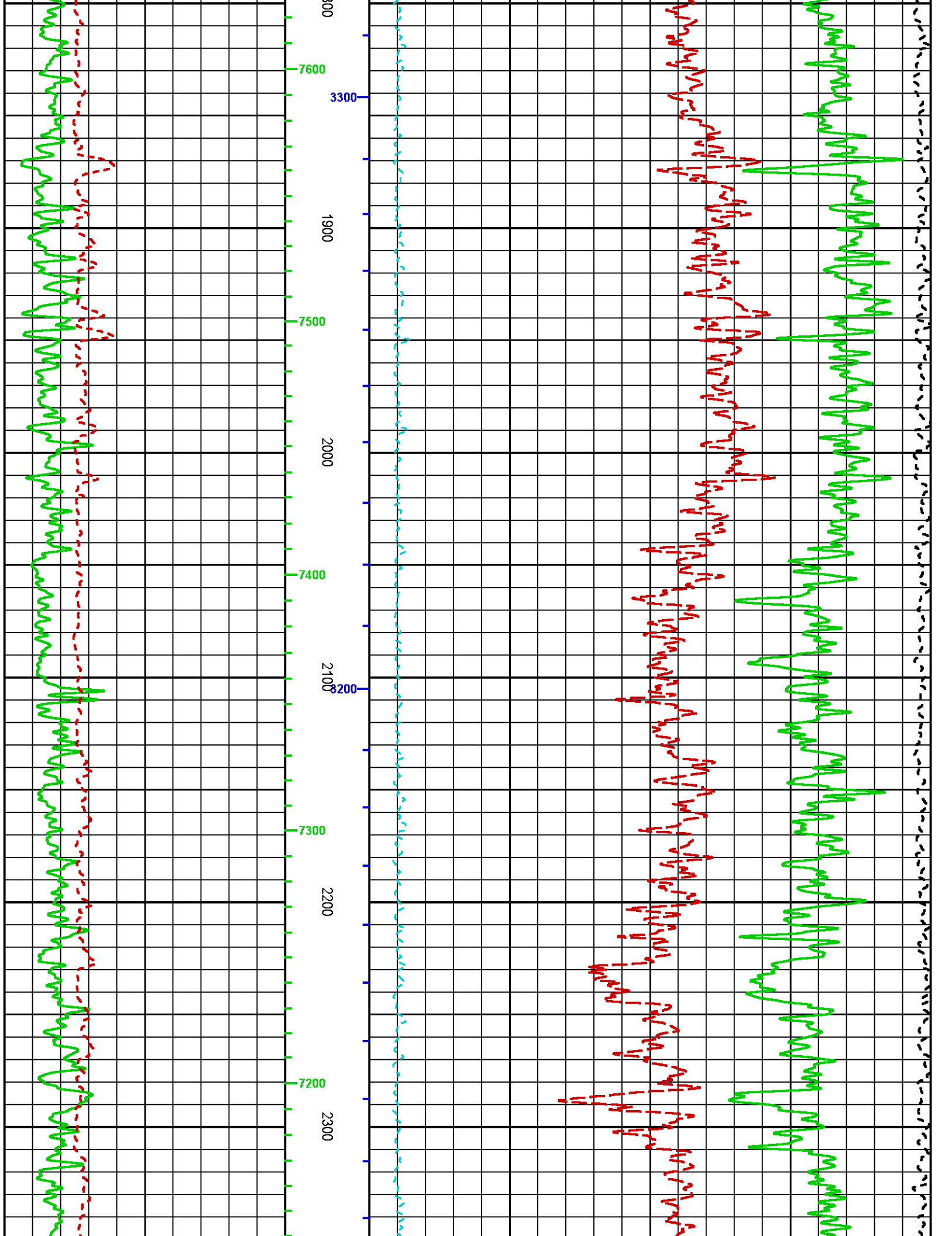
CURVE MEASURE POINT OFFSET

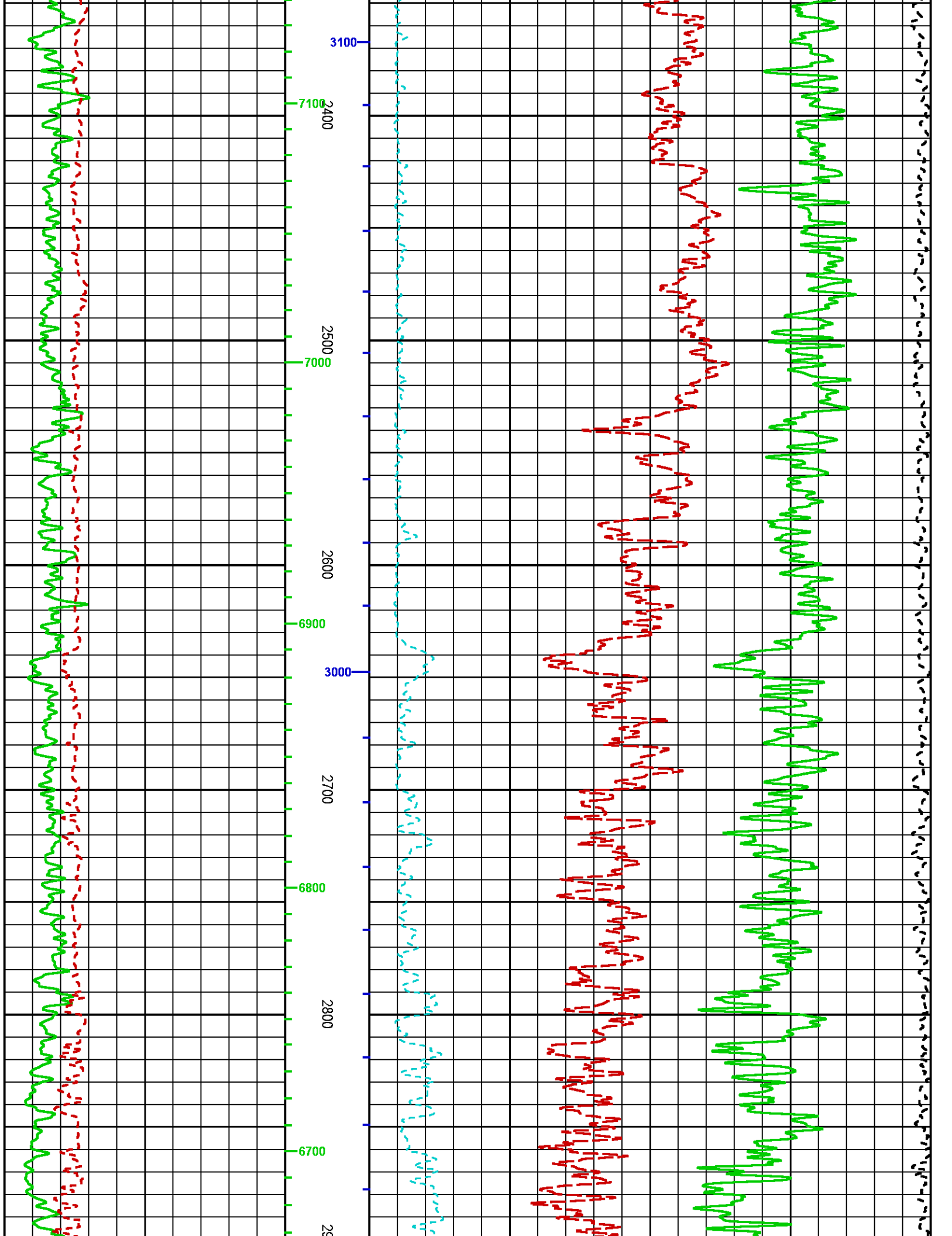
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
CALX	-49.00	GR	-66.25	ZCOR	-48.25		
CNC	-59.25	TEN	0.00	ZDNC	-48.25		

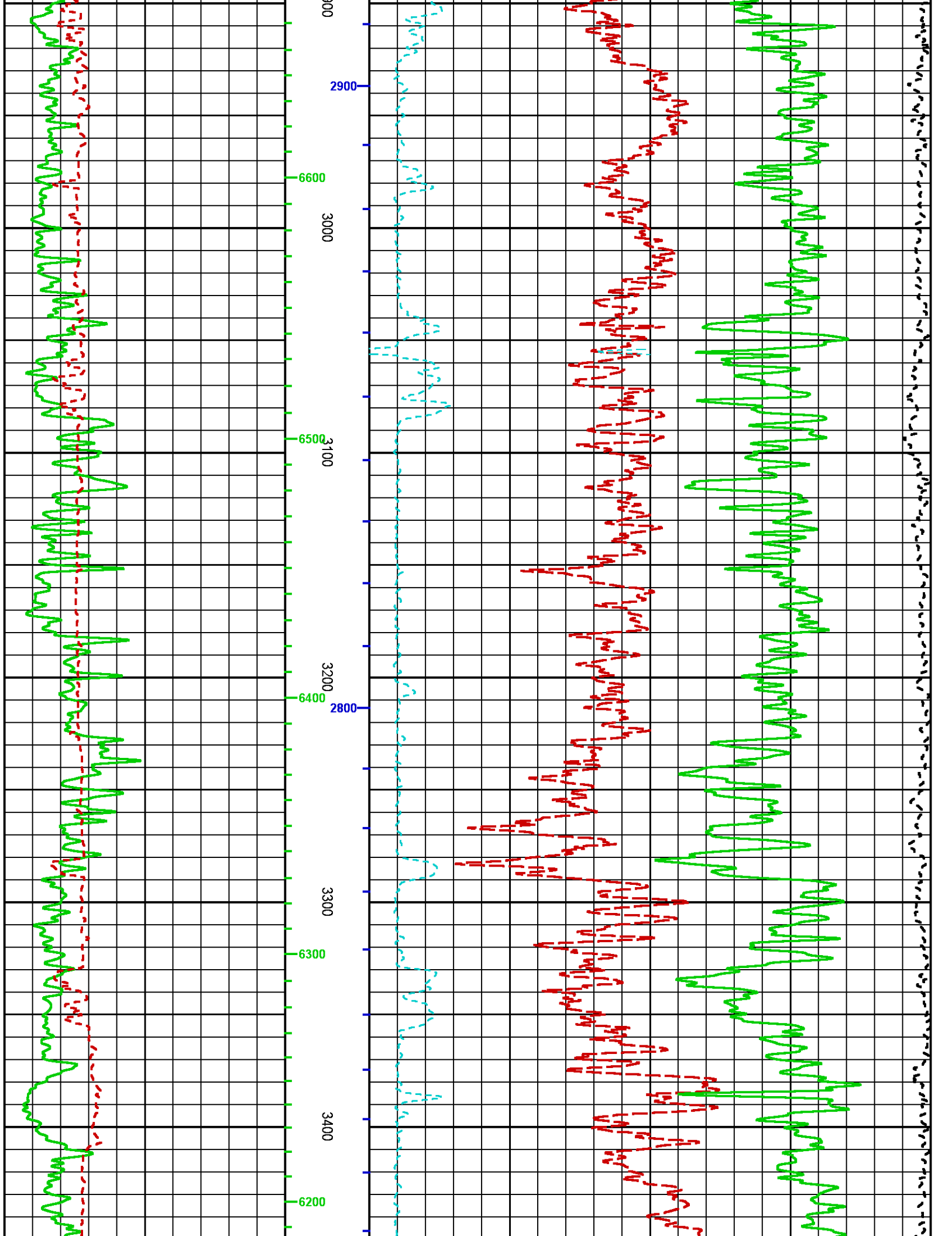
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Plot Interval : 1573 - 10372 Feet

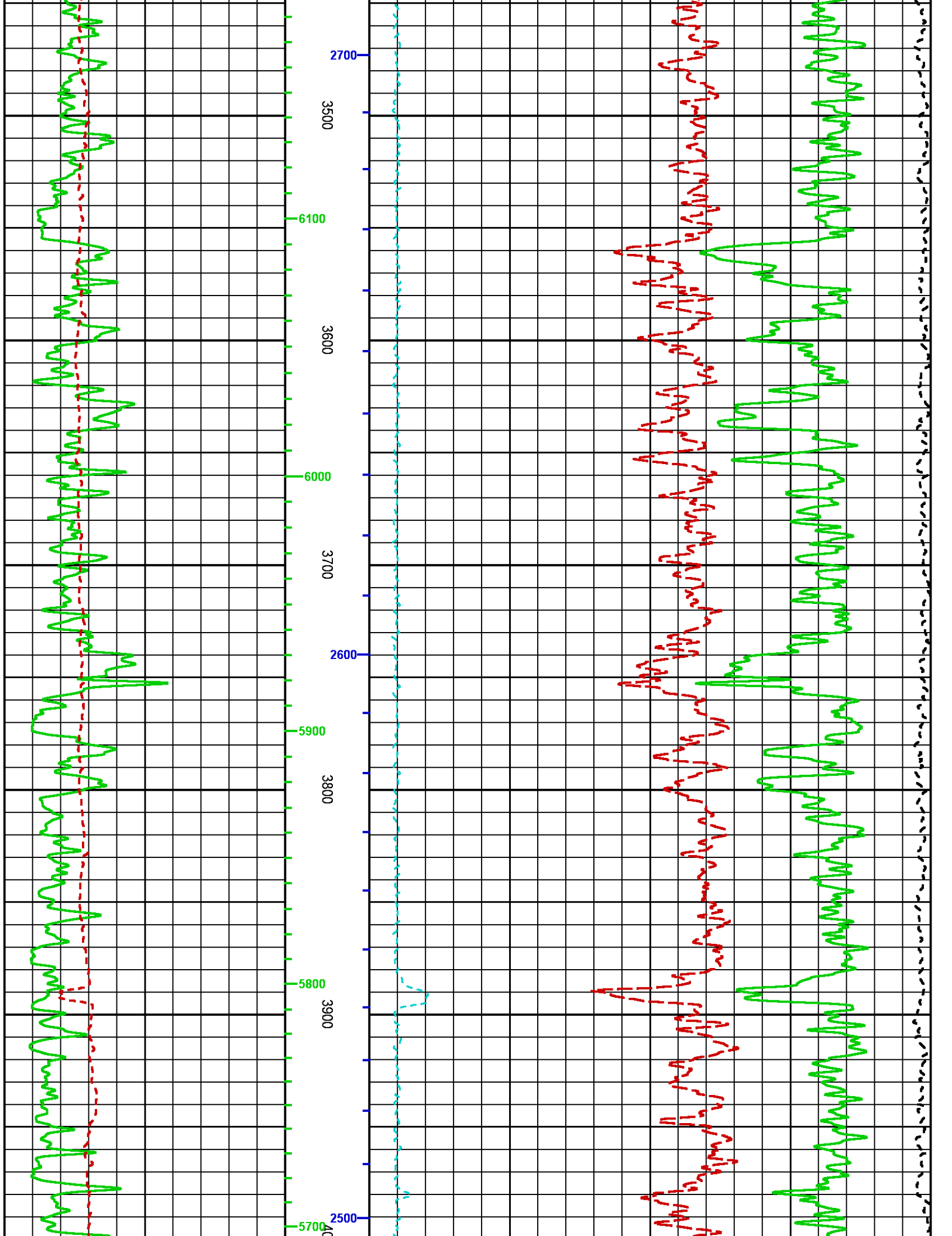
Data File 1 : F1 : HL6690:/dat1a/md11798R3/R2.xtf
Created On : N/A
Company : HOLLY FRONTIER - NAVAJO
Well : NAVAJO REFINING WDW #4
Field : ARTESIA
File Interval : 1558.5 - 10373.2 Feet
OCT : p87cc

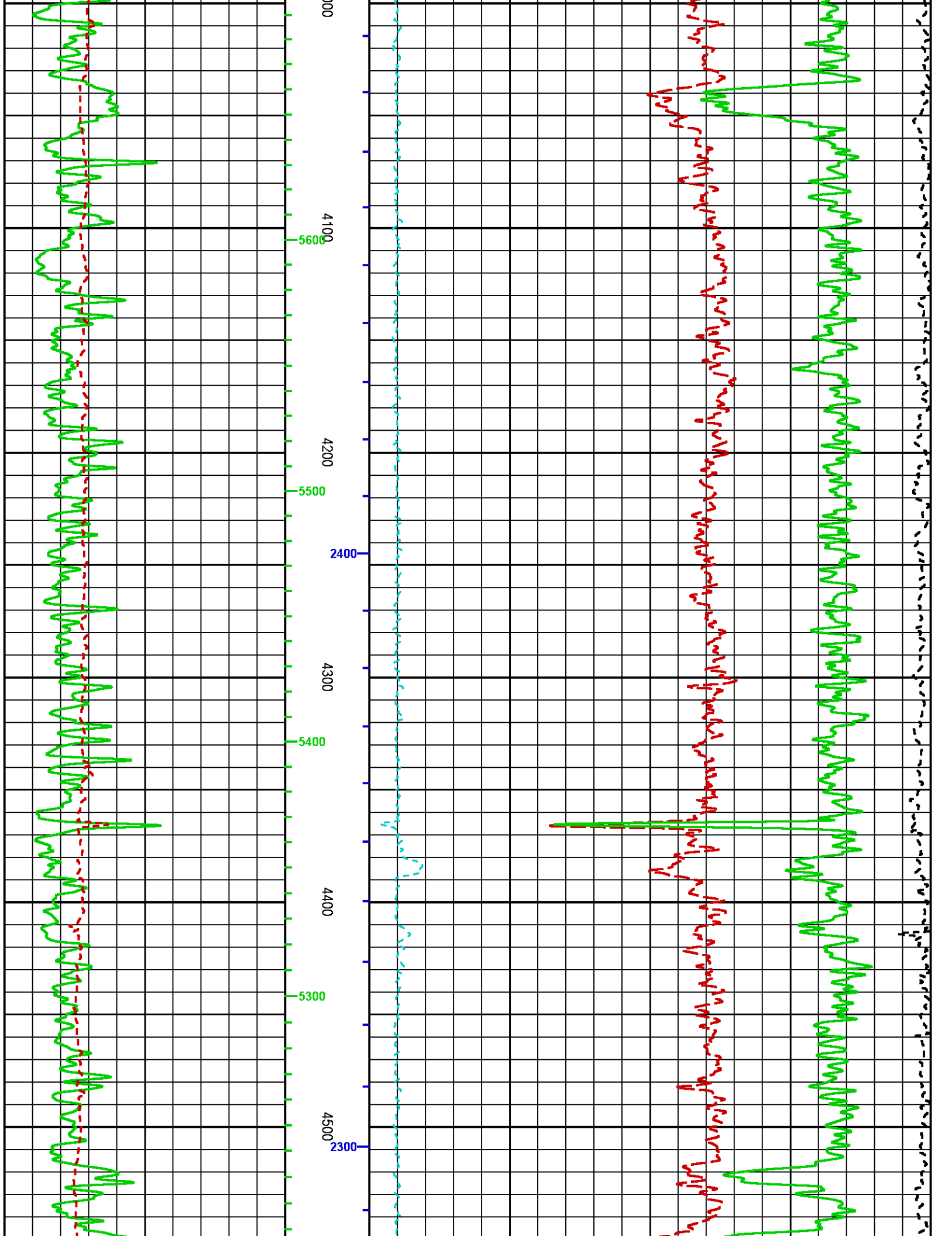


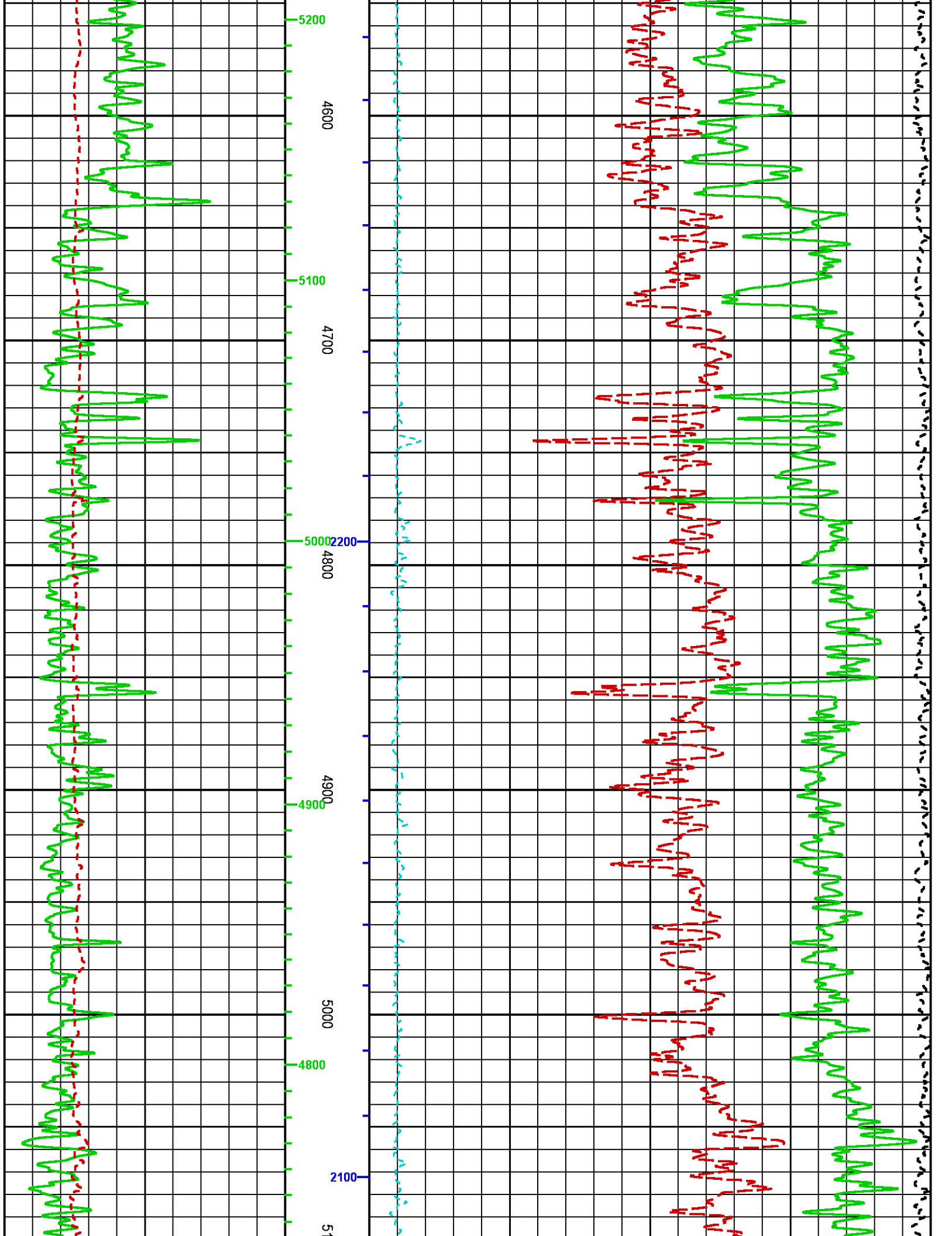


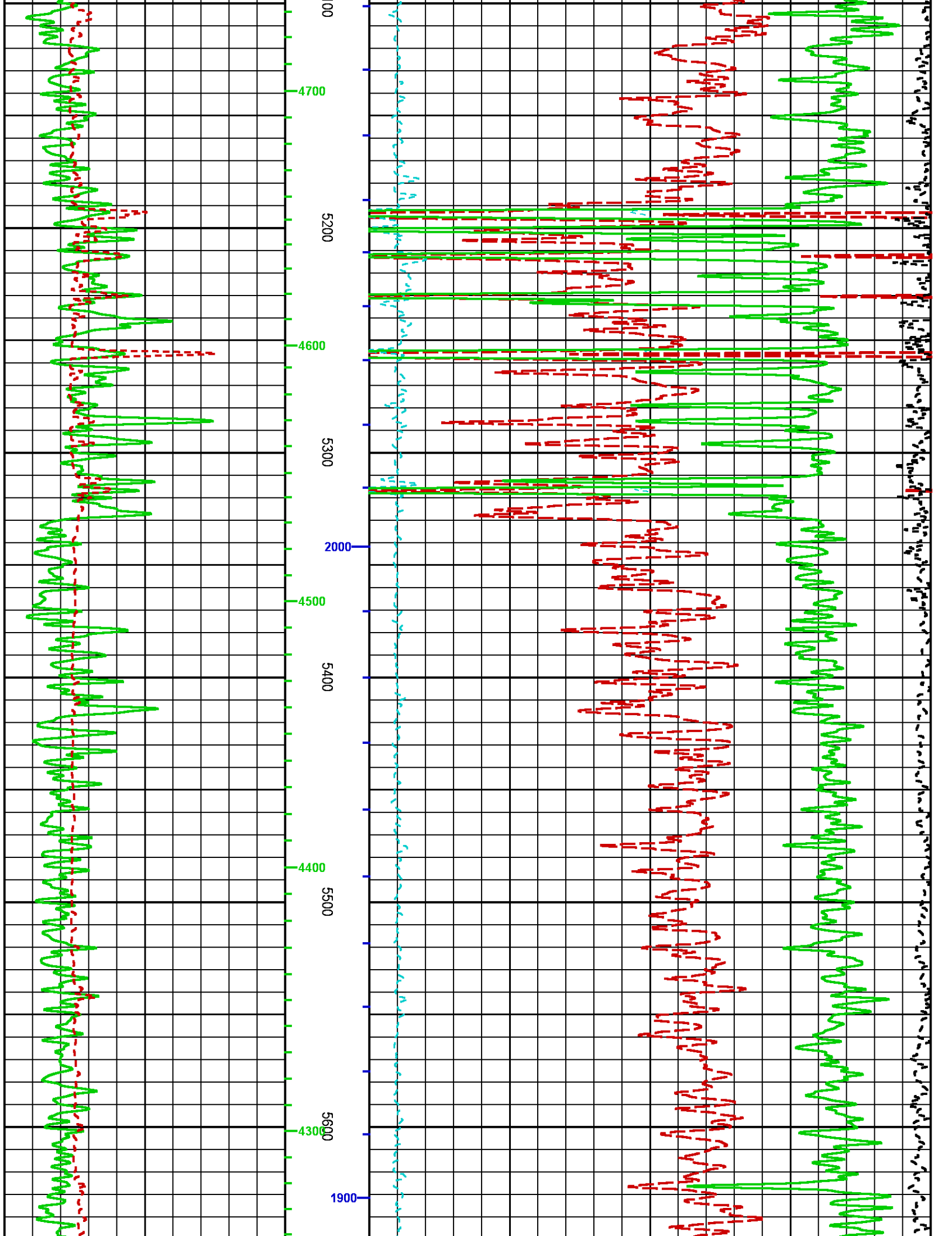


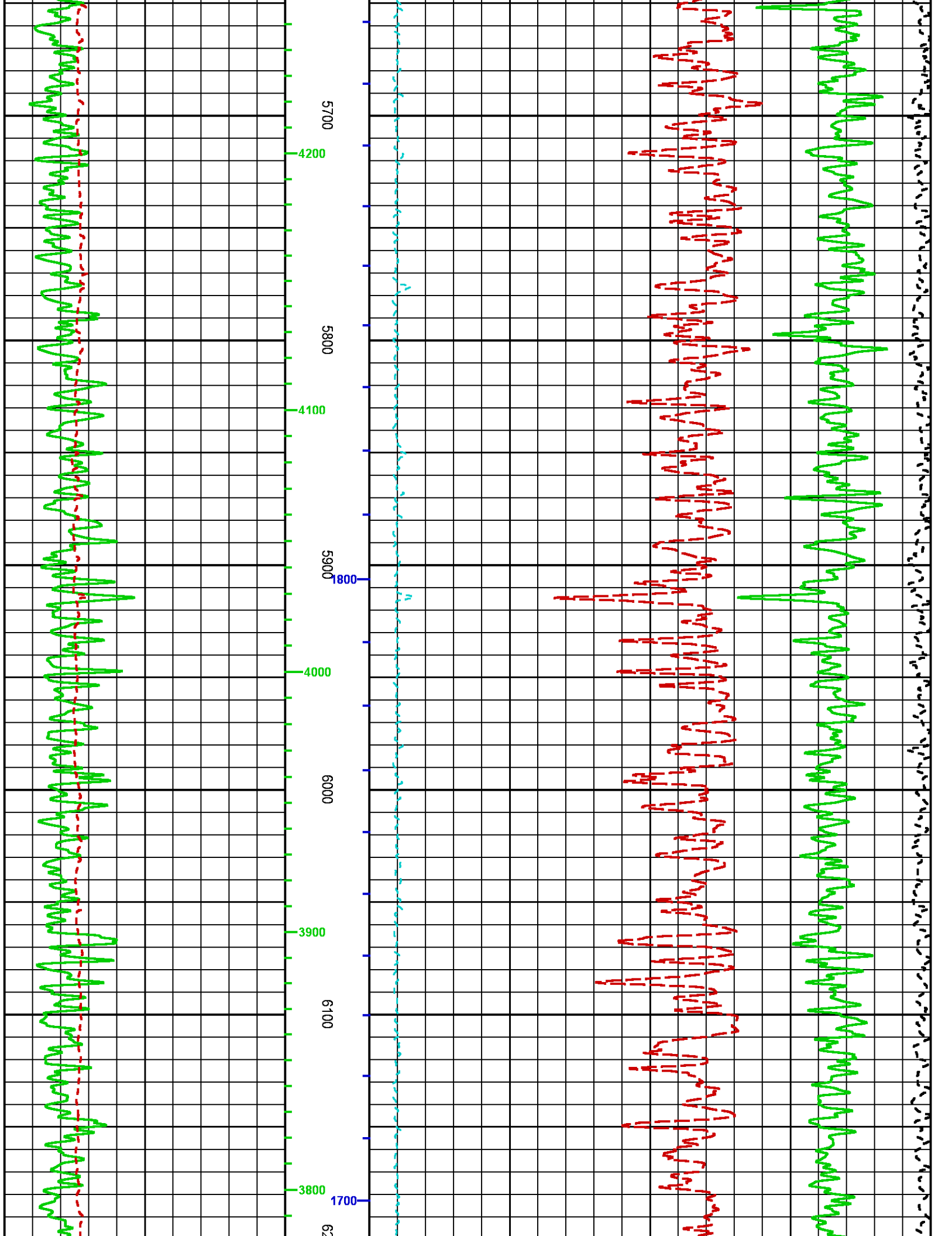


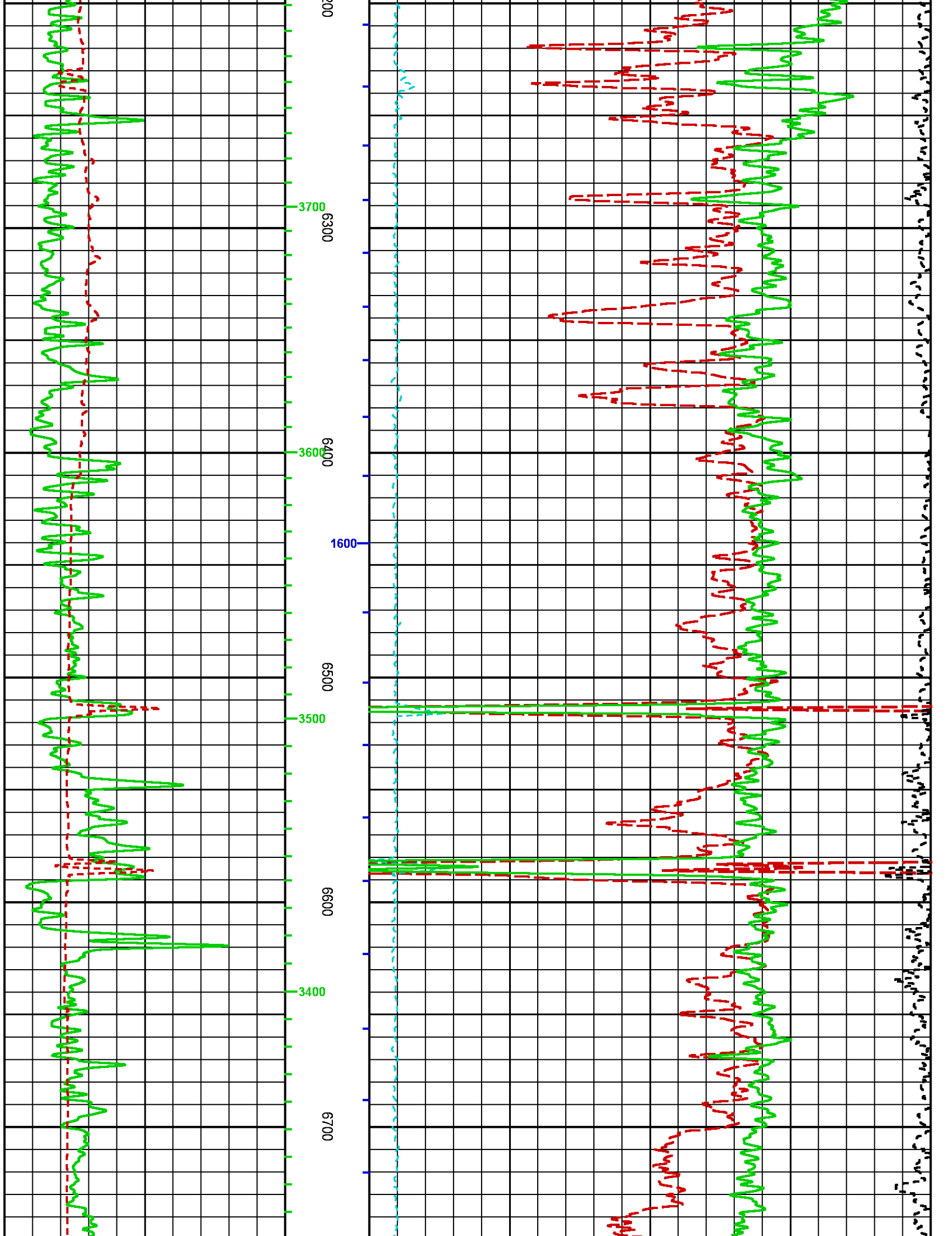


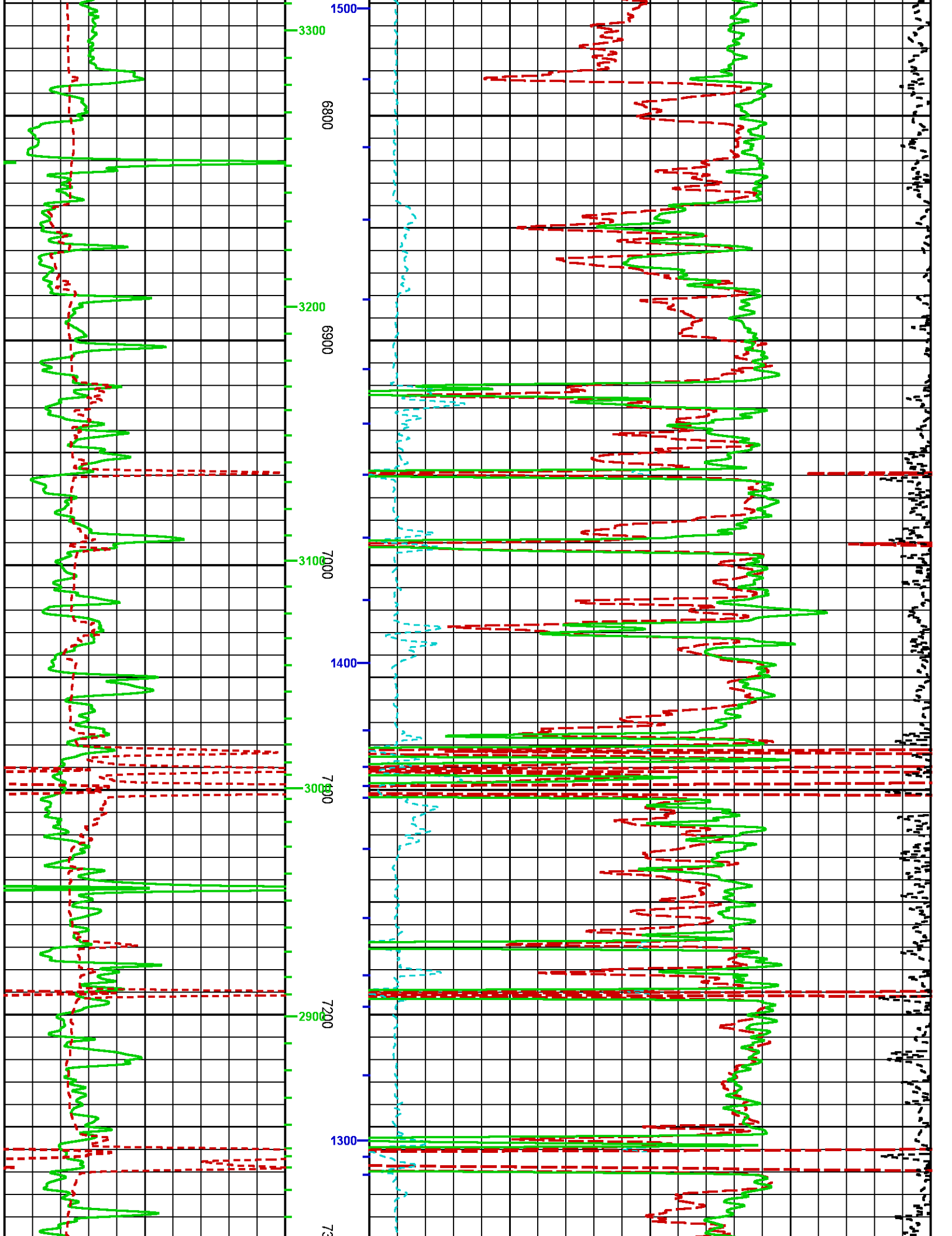


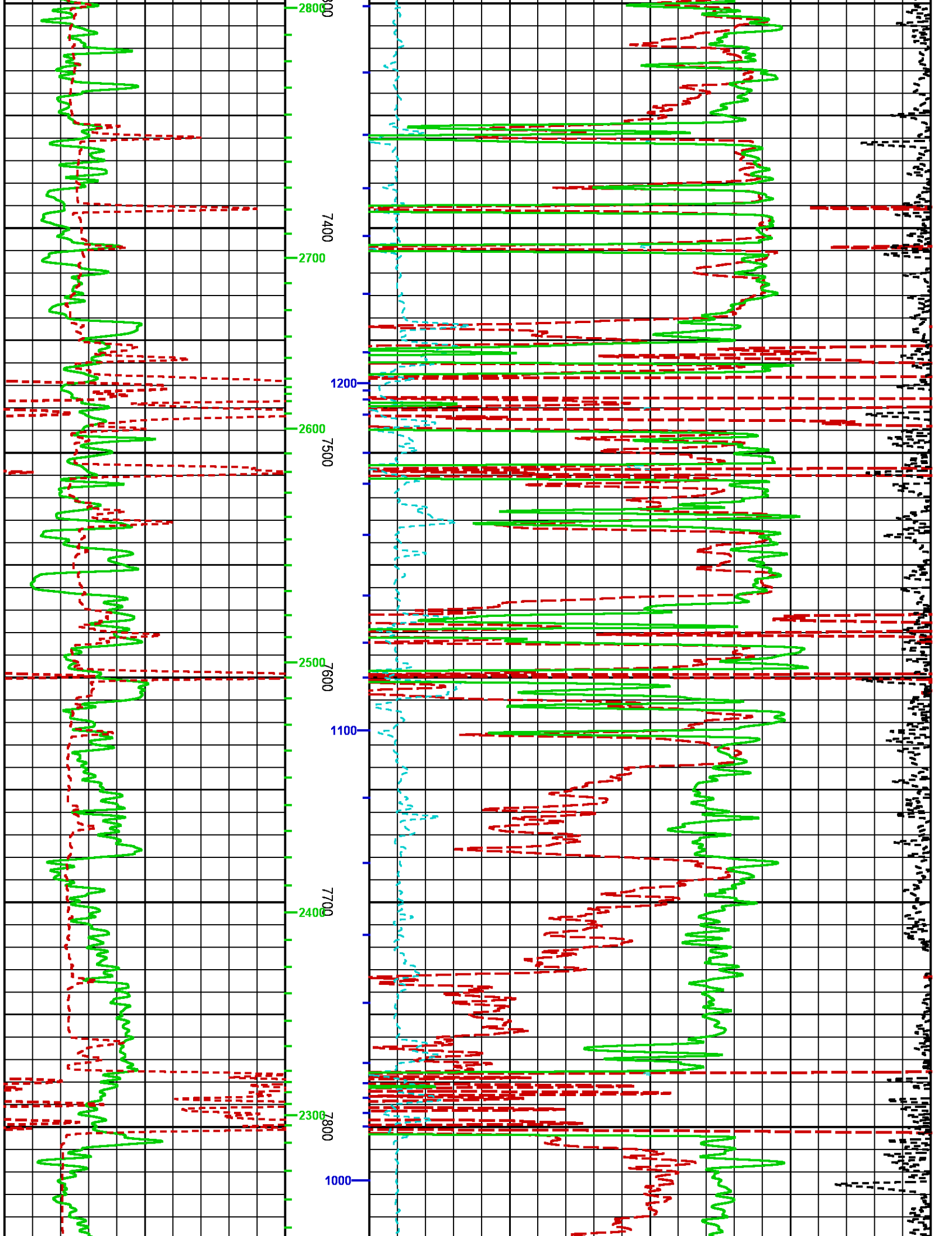


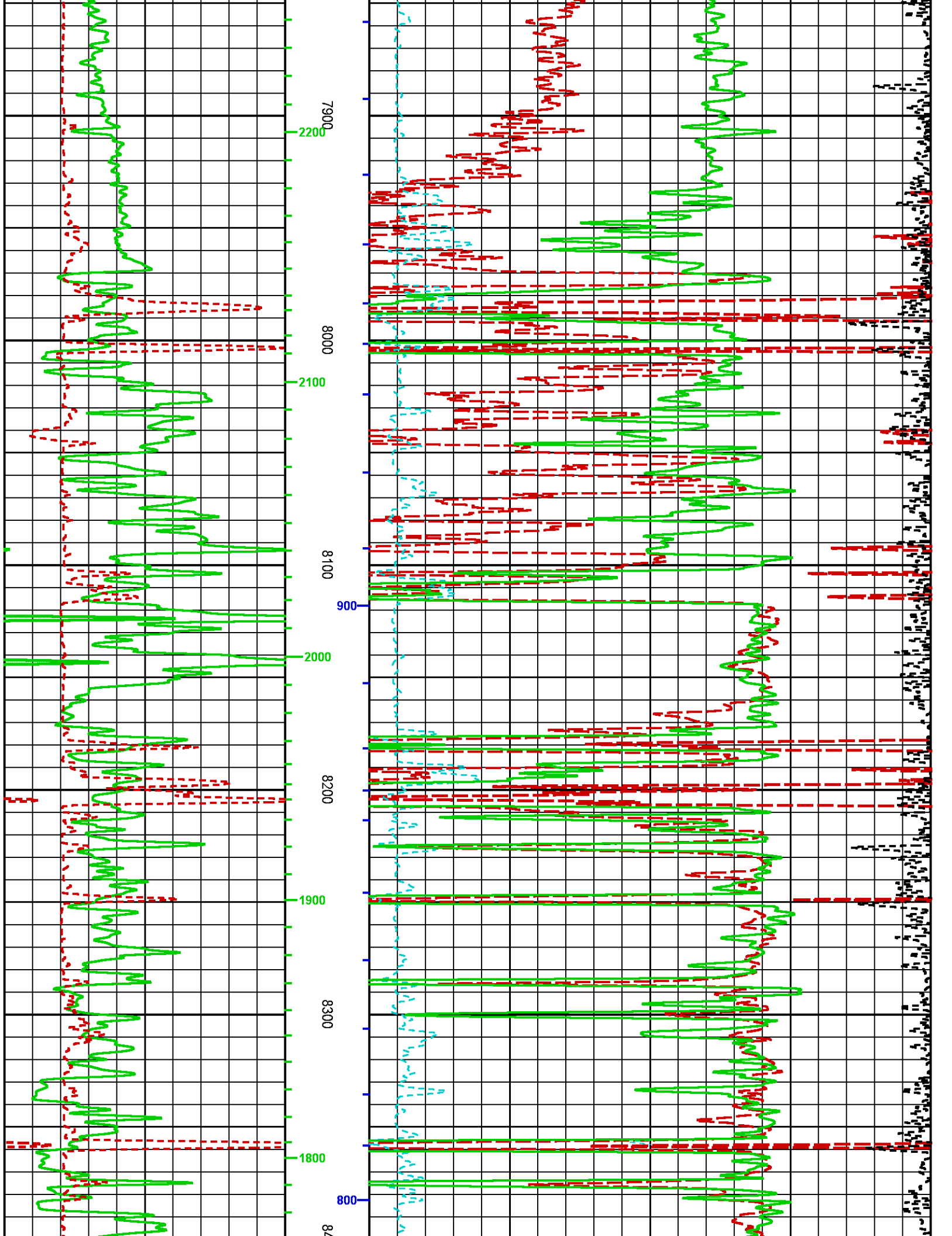


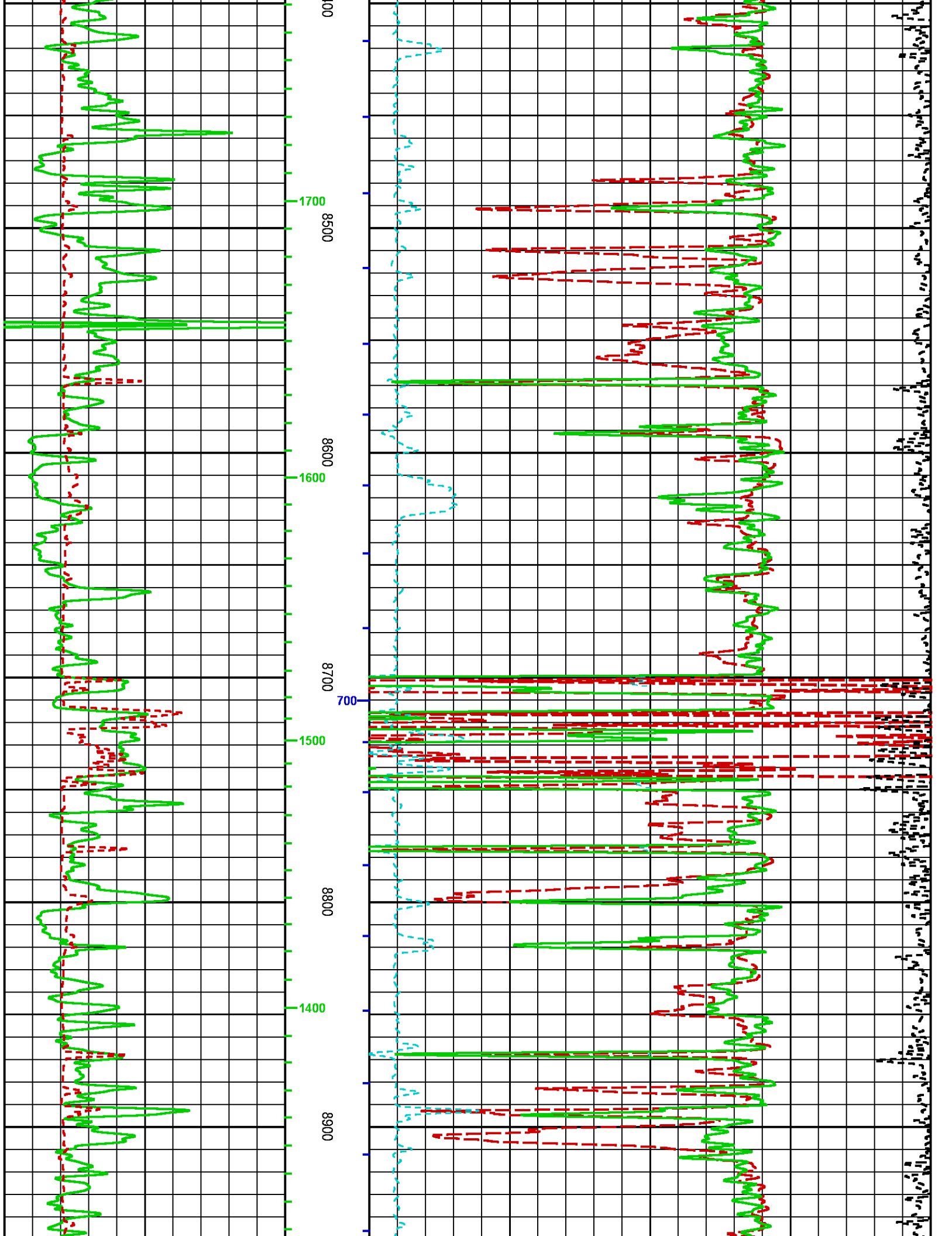


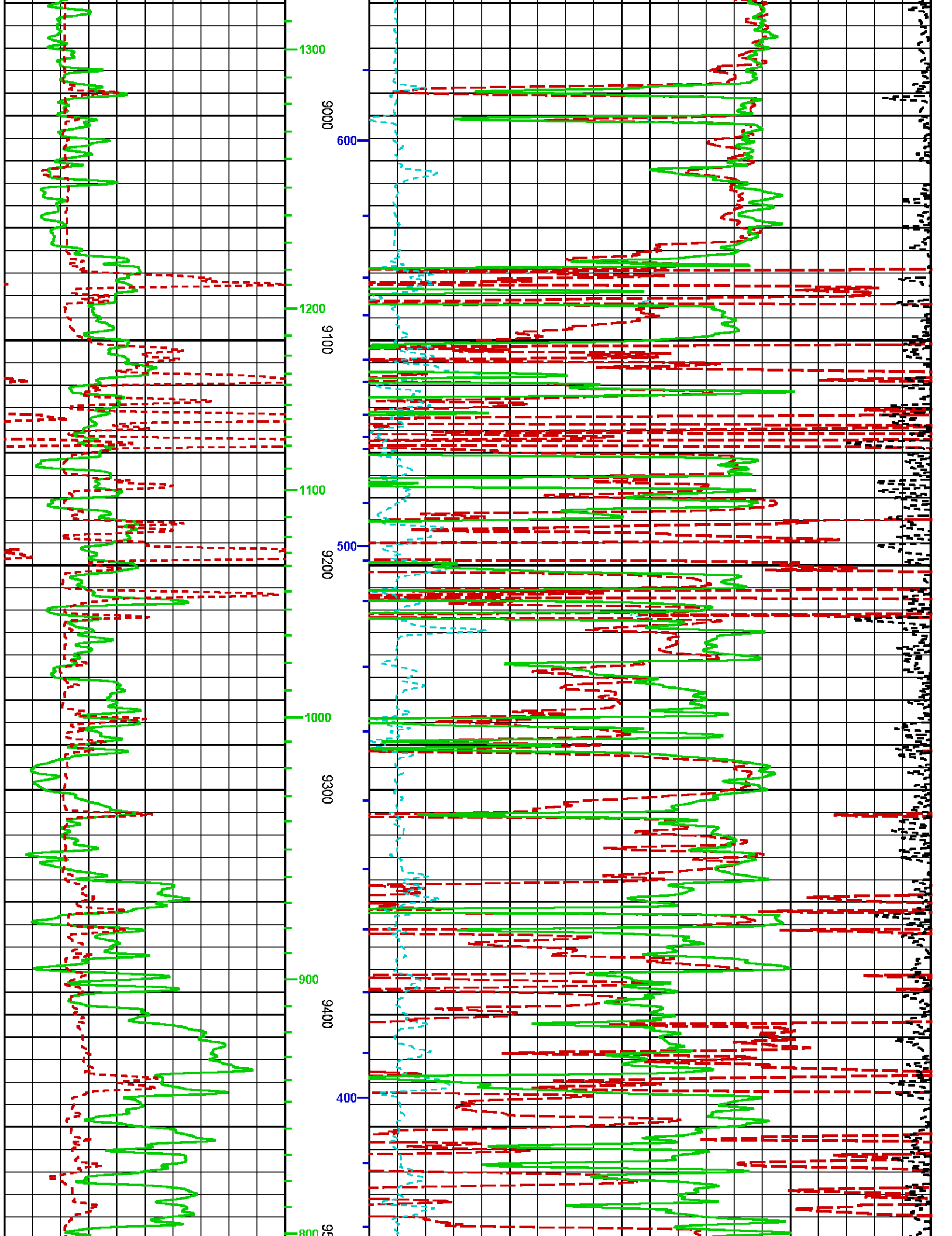


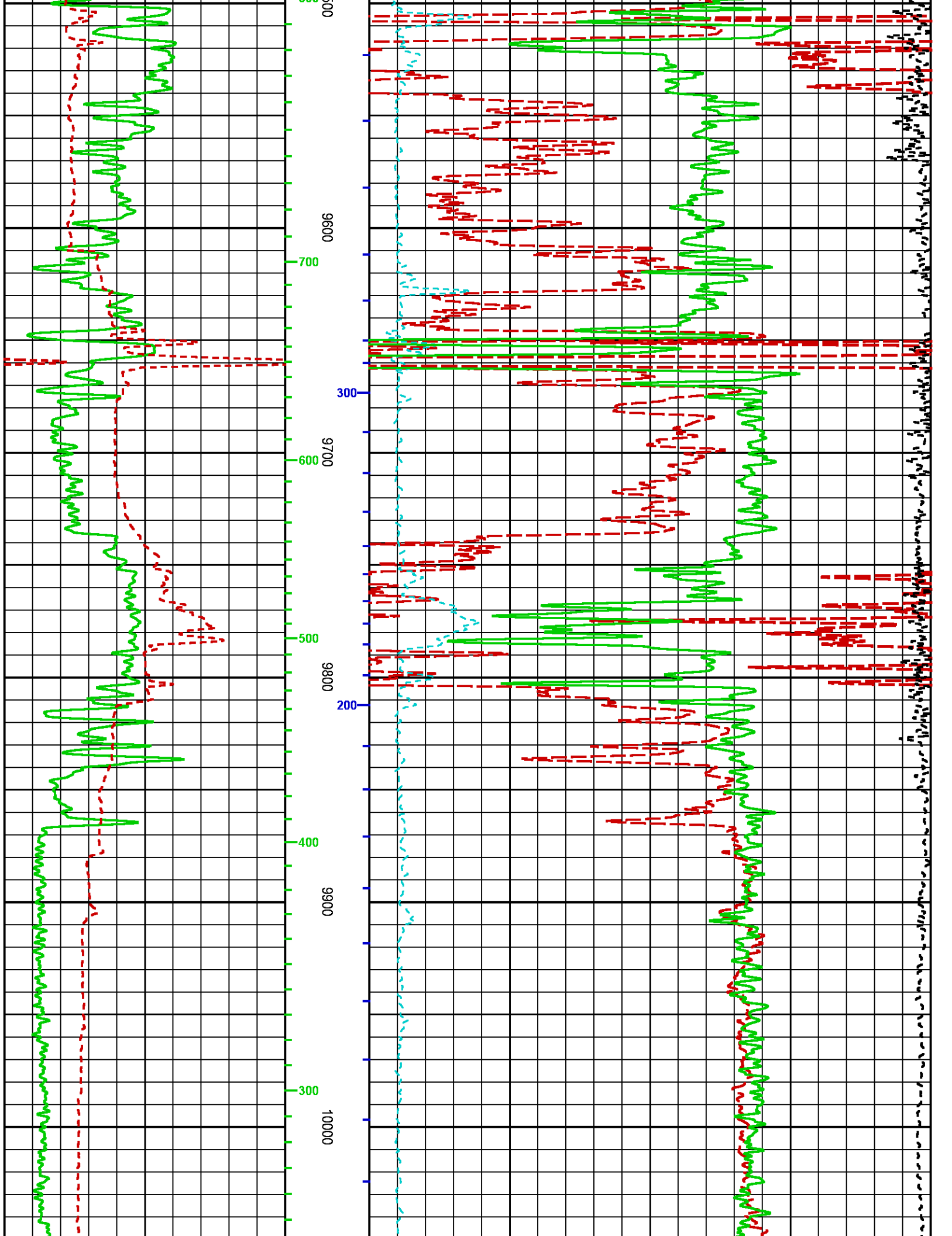


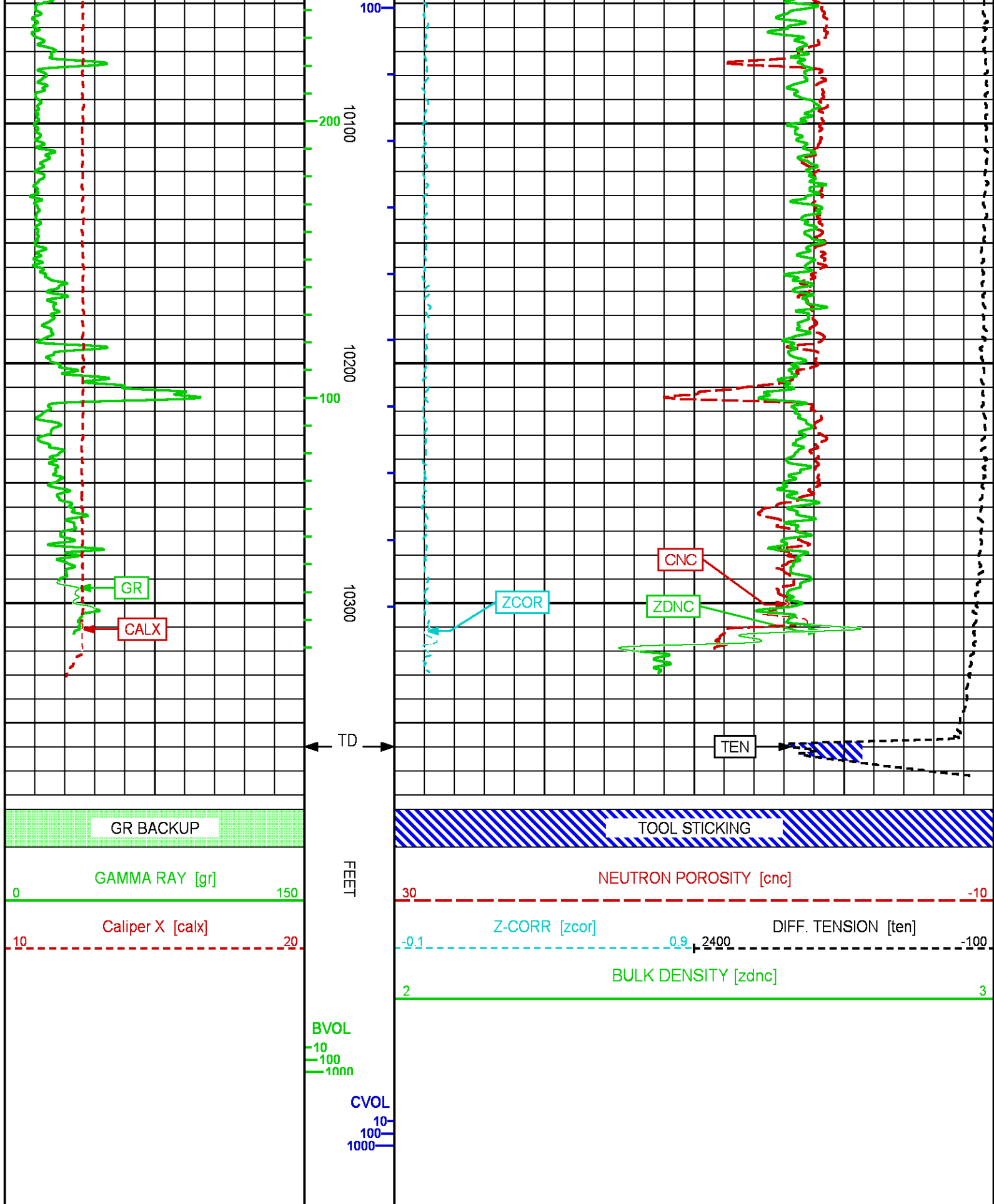












MAIN LOG 5"/100FT SCALE

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017
Updates: 32 Patches: 4

Plotted: Fri Jun 29 10:24:32 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/md11798R3/p87cc03.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 9691.591 ft BOTTOM DEPTH: 9691.591 ft

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
TENSION	FILTER ()	medium (1)		TOP	BOTTOM
GR	FILTER ()	medium (1)		"	"
SL	FILTER ()	medium (1)		"	"
CN	FILTER ()	medium (1)		"	"
CALIPER	FILTER ()	medium (1)		"	"
ZDL MED RES	FILTER (hrd1*)	medium		"	"
	FILTER (hrd1s*)	medium		"	"
	FILTER (hrd2*)	medium		"	"
	FILTER (hrd2s*)	medium		"	"
	FILTER (soft*)	medium		"	"

BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	9.625	in	TOP	BOTTOM
	CASING THICKNESS	0.000	in	"	"
X-Y COMBINED CALIPER PROCESSING	X-Y Caliper	X-Axis		"	"
BIT SIZE	BIT SIZE	12.250	in	"	"
MUD DENSITY	MUD DENSITY	9.80	lbm/gal	"	"
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (slbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (zdbh*)	USE CALIPER		"	"
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	12.250	in	"	"
	FIXED DIAMETER (slbh*)	12.250	in	"	"

SL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
SL BOREHOLE	OPEN/CASED HOLE	OPEN HOLE		TOP	BOTTOM
	K COMPOUND WEIGHT %	0.00	pct	"	"
	K MUD COMPOUND TYPE	KCL		"	"
SL AUTOGAIN	AUTO GAIN (1329XA 1)	ON		"	"
SL SPECTRUM CALIBRATION	MODE	AUTOMATIC		"	"

CN PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
2446 CN MATRIX	2446 MATRIX	LIMESTONE		TOP	BOTTOM
CN SALINITY CORRECTION	SALINITY CORR (2446)	SALINITY OFF		"	"
	SALINITY	0	ppm	"	"
CN TOOL STANDOFF	ENABLE STANDOFF CORR	OFF		"	"
	STANDOFF AMOUNT	0.00	in	"	"
CN CASING & CEMENT CORRECTION	CORRECTION	OFF		"	"
	BIT SIZE BEHIND CSNG	7.875	in	"	"

ZDL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
MUD DENSITY	MUD DENSITY	9.80	lbm/gal	TOP	BOTTOM
DENSITY POROSITY	RHOfmatrix	2.710	g/cm3	"	"
	RHOffluid	1.000	g/cm3	"	"
EDU	EDU	0.00		"	"

ZDL	DENX TRACKING	ON	"	"
TRACKING TIME	Logging Spd for Gain	Over 10 ft/min	"	"

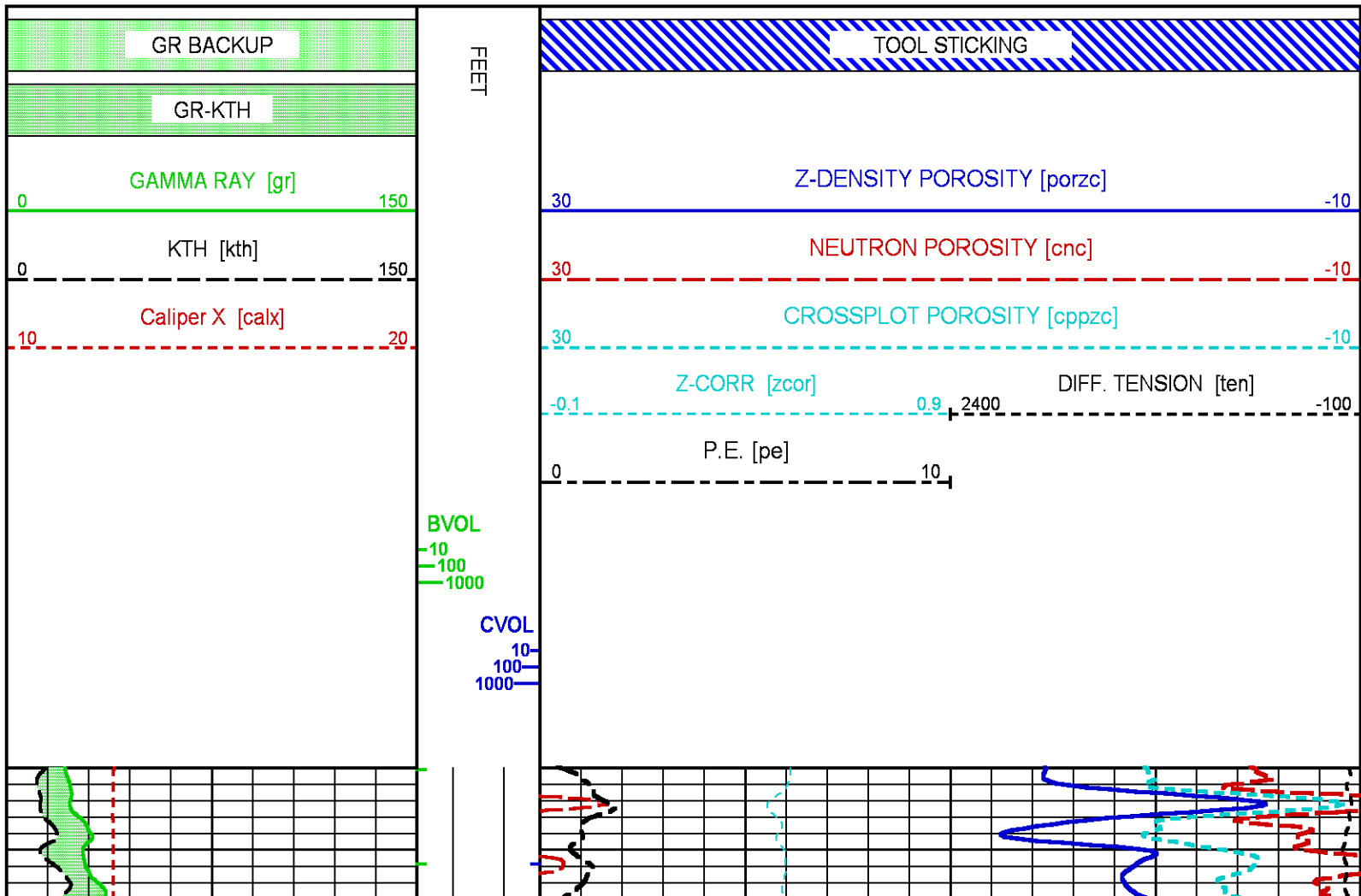
CURVE DESCRIPTION REPORT

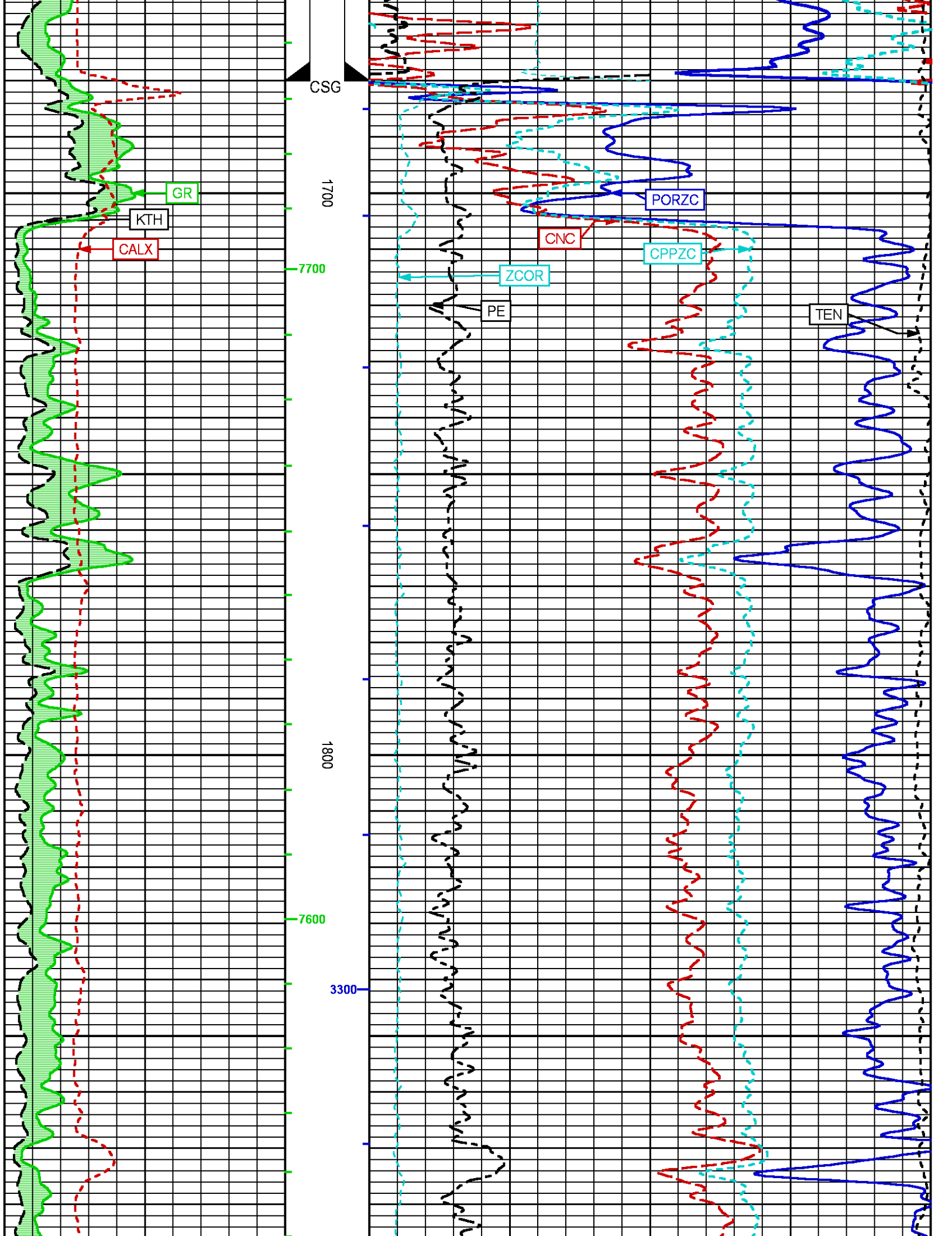
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BVOL	N/A	BOREHOLE VOLUME
F1:CALX	N/A	CALIPER FROM X-AXIS OF XY CALIPER(S)
F1:CNC	N/A	BOREHOLE SIZE CORRECTED COMPENSATED NEUTRON POROSITY
F1:CPPZC	N/A	CROSSPLOT POROSITY FROM ZDEN
F1:CVOL	N/A	CEMENT VOLUME
F1:GR	N/A	GAMMA RAY
F1:KTH	N/A	STRIPPED POTASSIUM-THORIUM
F1:PE	N/A	PHOTO ELECTRIC CROSS-SECTION
F1:PORZC	N/A	CORRECTED POROSITY
F1:TEN	N/A	DIFFERENTIAL TENSION
F1:ZCOR	N/A	DENSITY CORRECTION

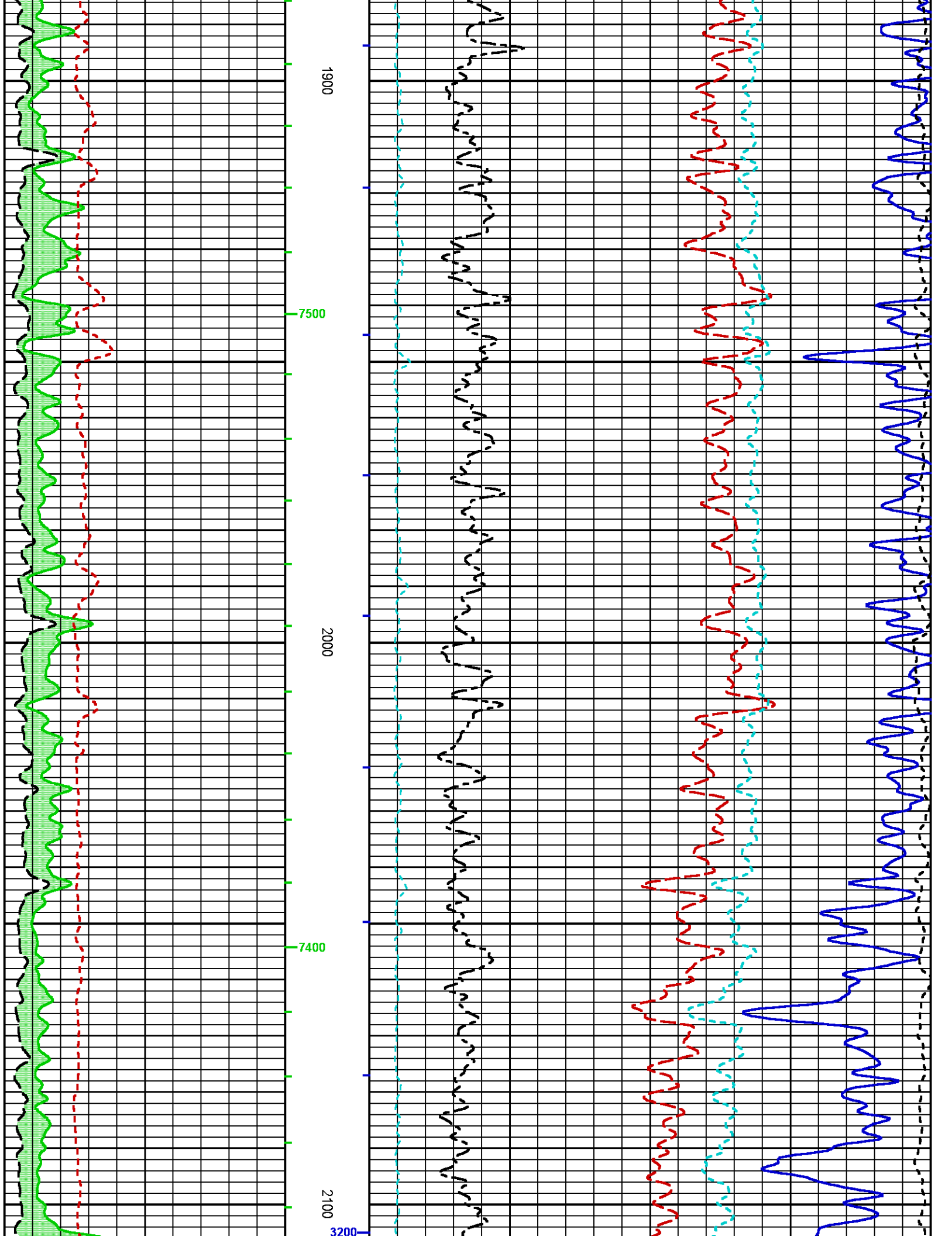
CURVE MEASURE POINT OFFSET

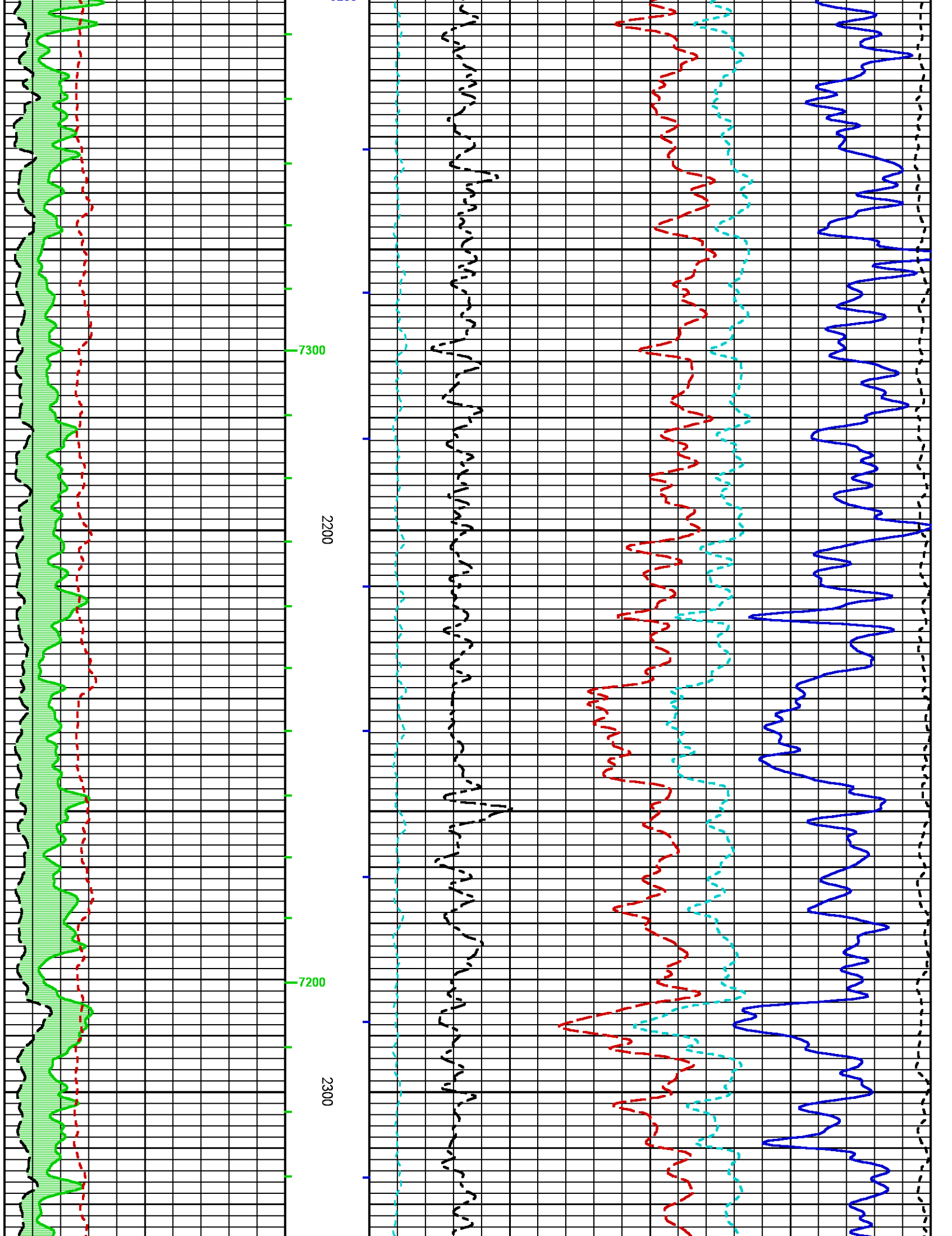
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
CALX	-49.00	GR	-66.25	PORZC	-48.25		
CNC	-59.25	KTH	-66.25	TEN	0.00		
CPPZC	-48.25	PE	-48.25	ZCOR	-48.25		

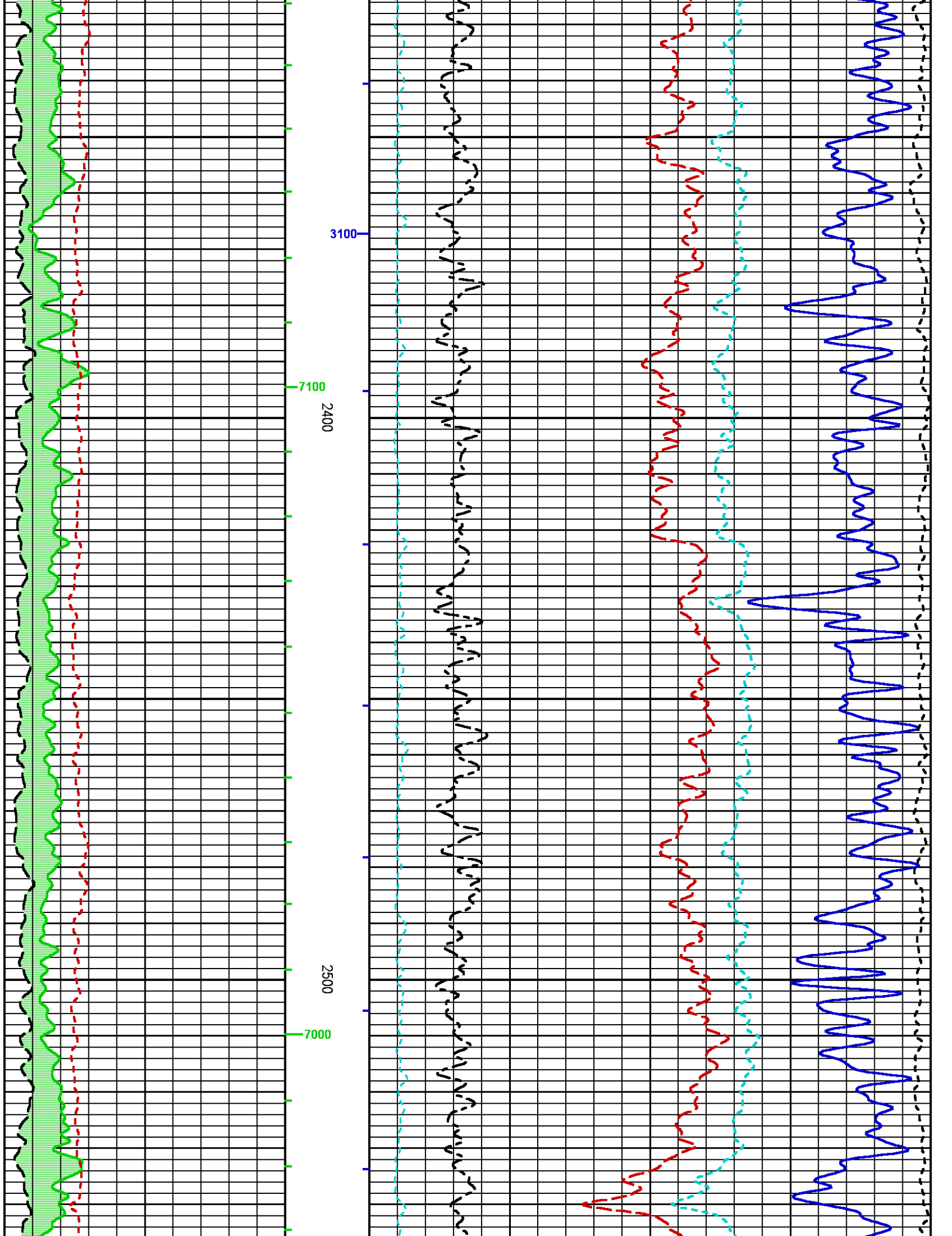
Presentation	: HL6690:/dat1a/md11798R3/POR_TX_5.fvpdf [5"/100' Scale]
Plot Interval	: 1650 - 10372 Feet
Data File 1	: F1 : HL6690:/dat1a/md11798R3/R2.xtf
Created On	: N/A
Company	: HOLLY FRONTIER - NAVAJO
Well	: NAVAJO REFINING WDW #4
Field	: ARTESIA
File Interval	: 1558.5 - 10373.2 Feet
OCT	: p87cc

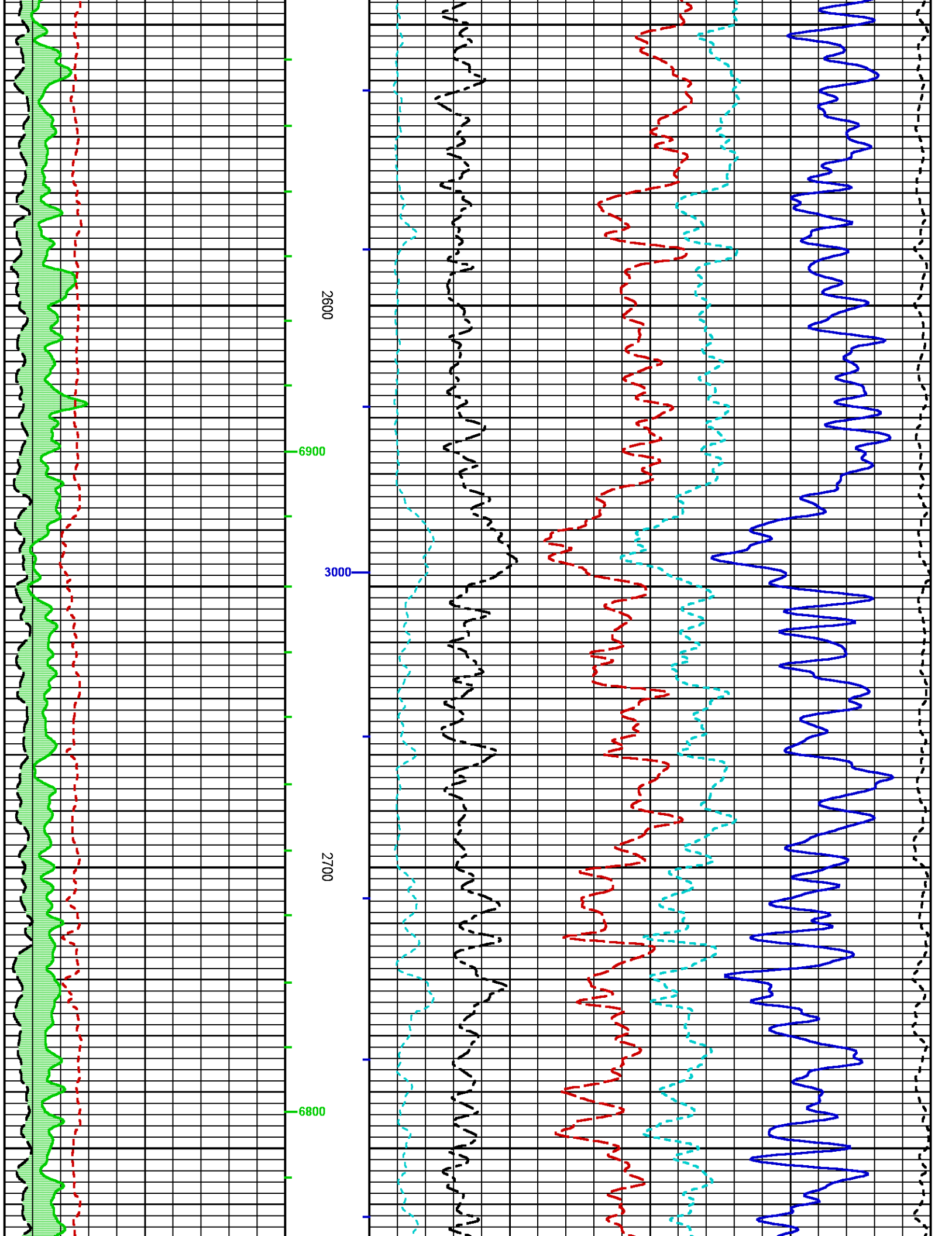


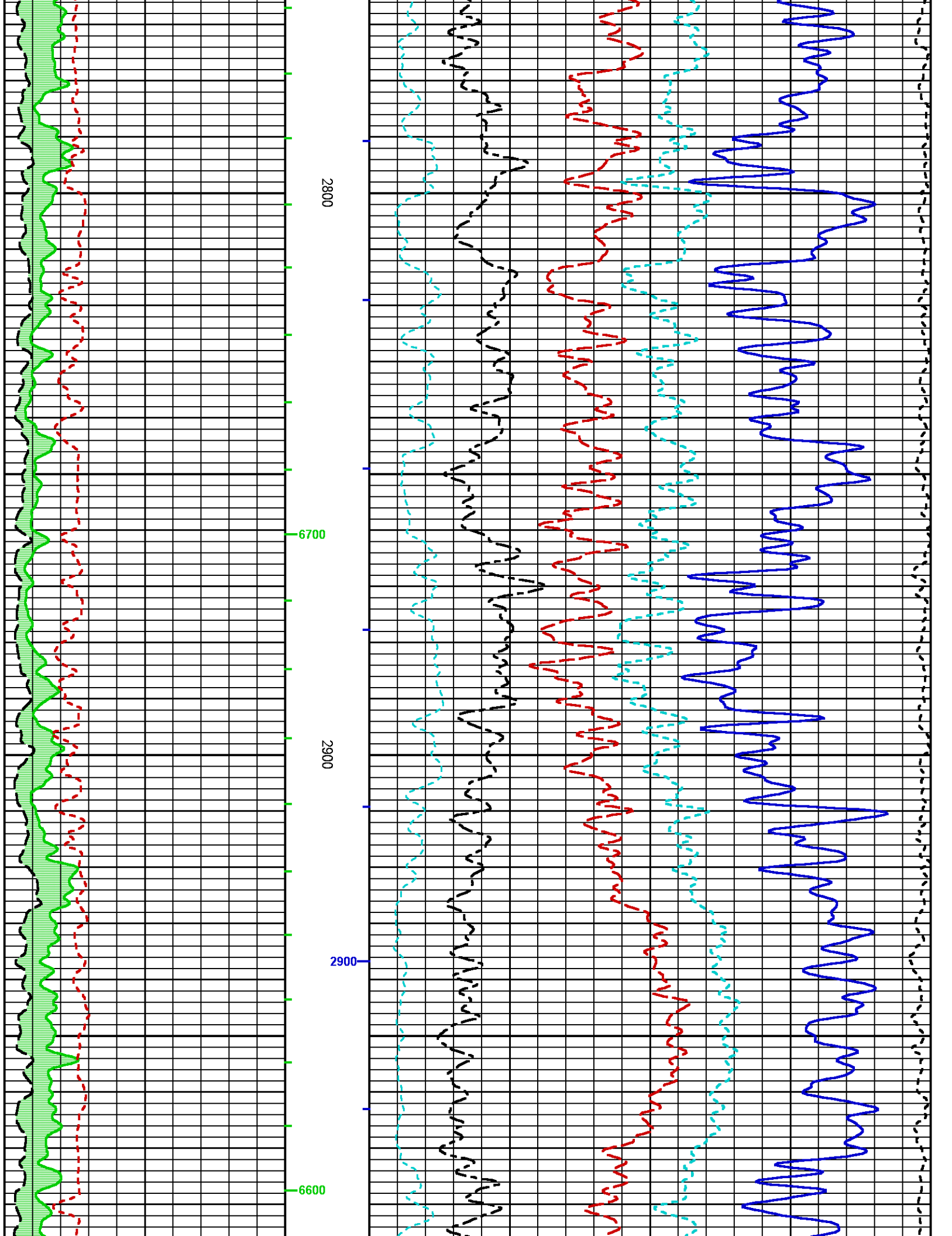


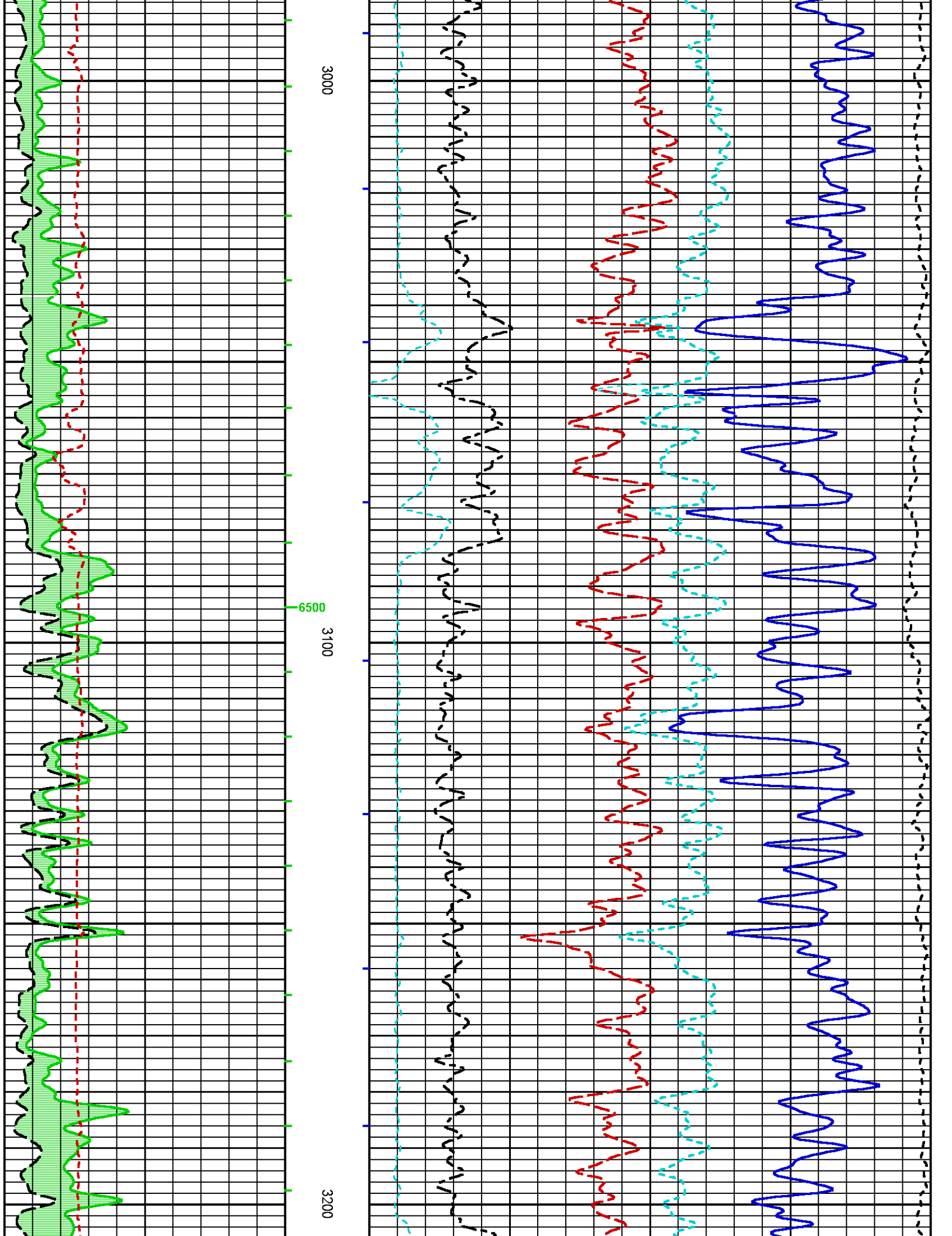


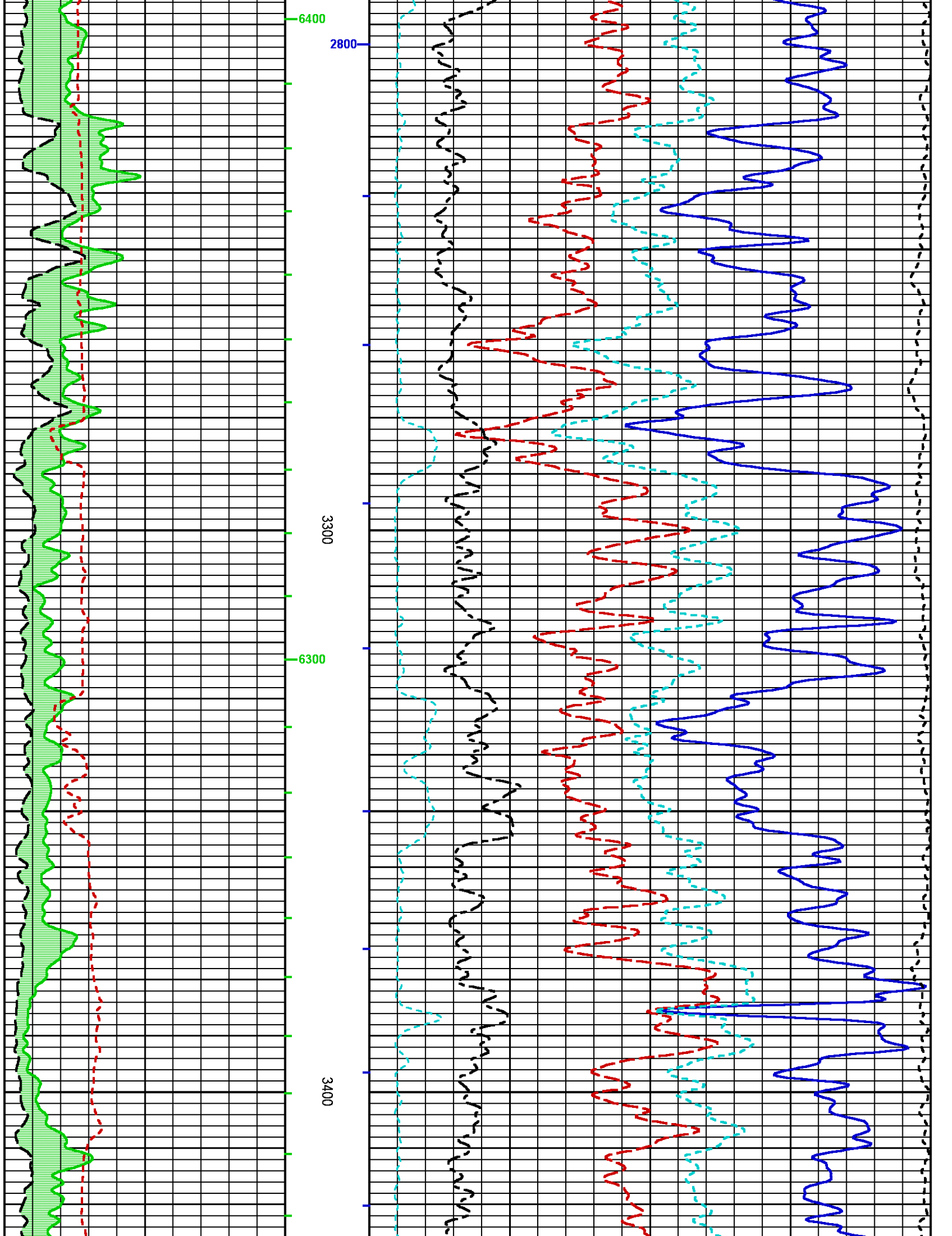


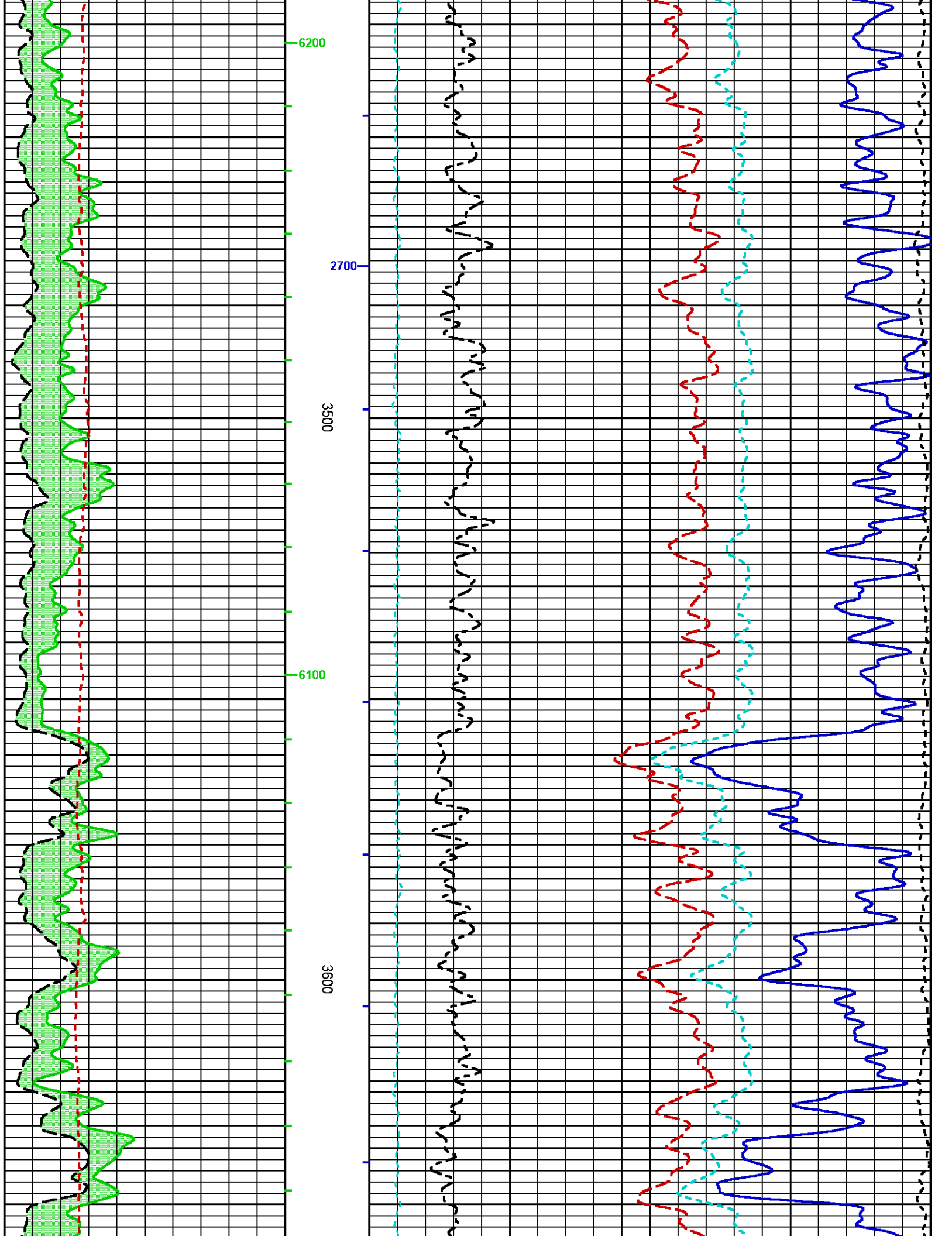


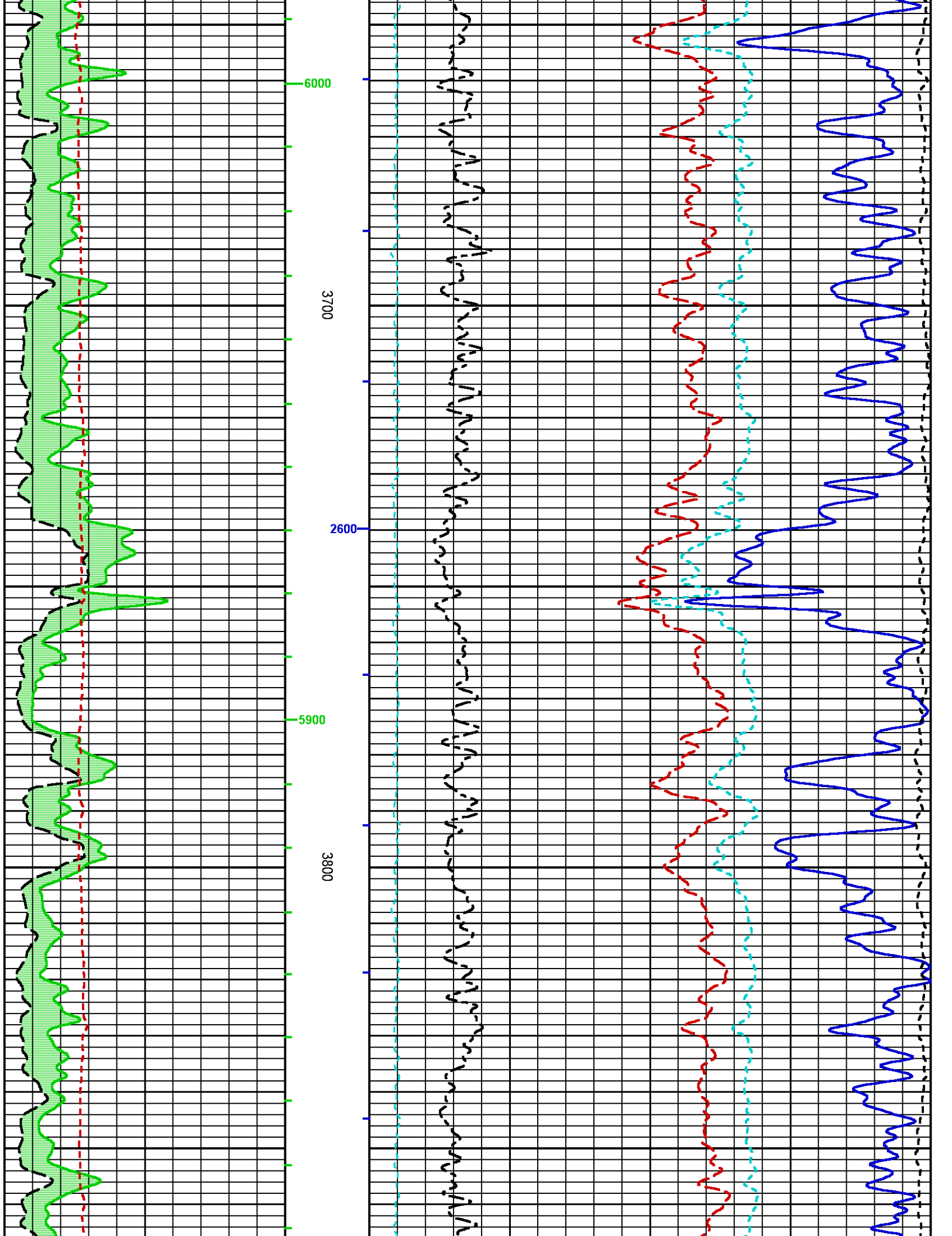


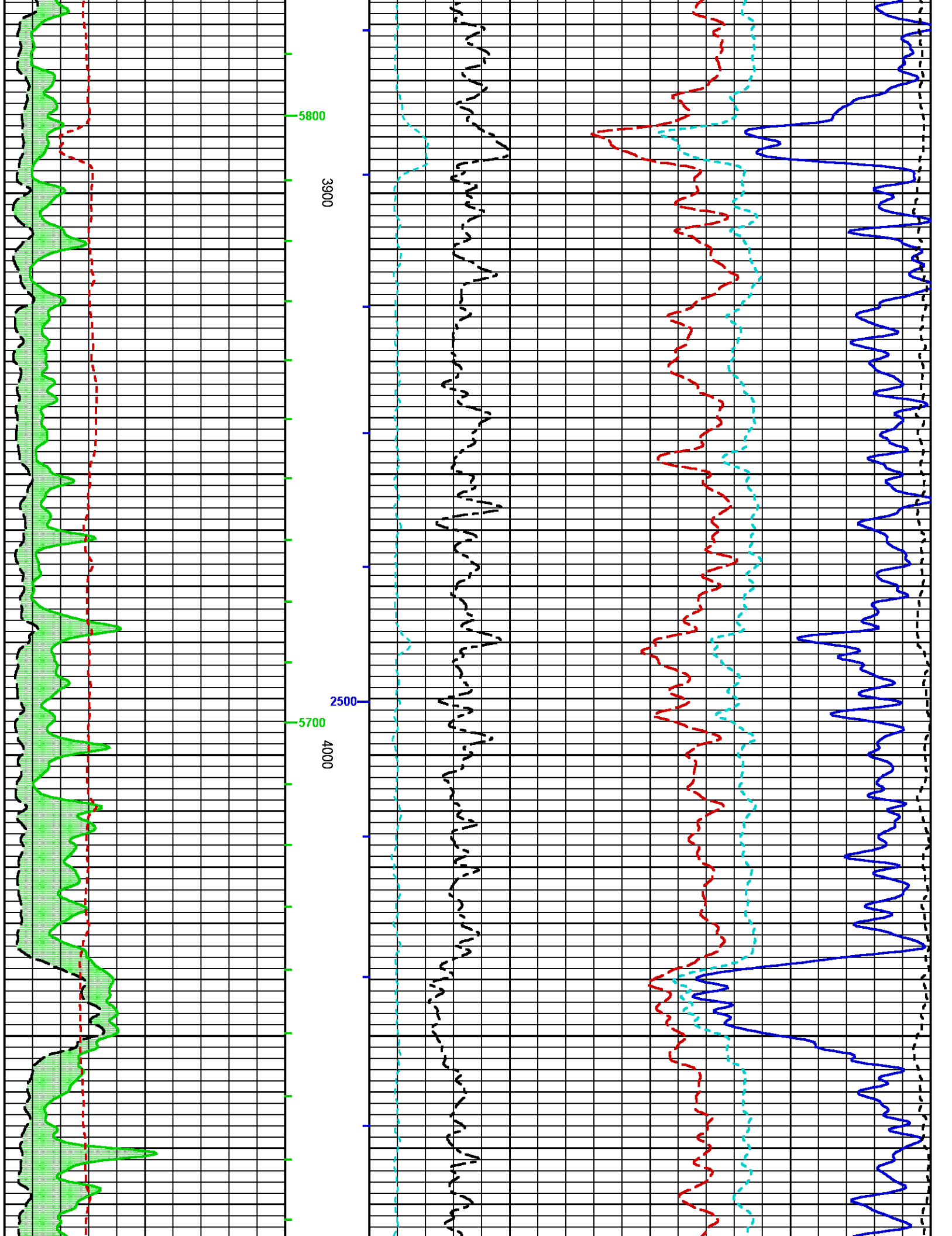


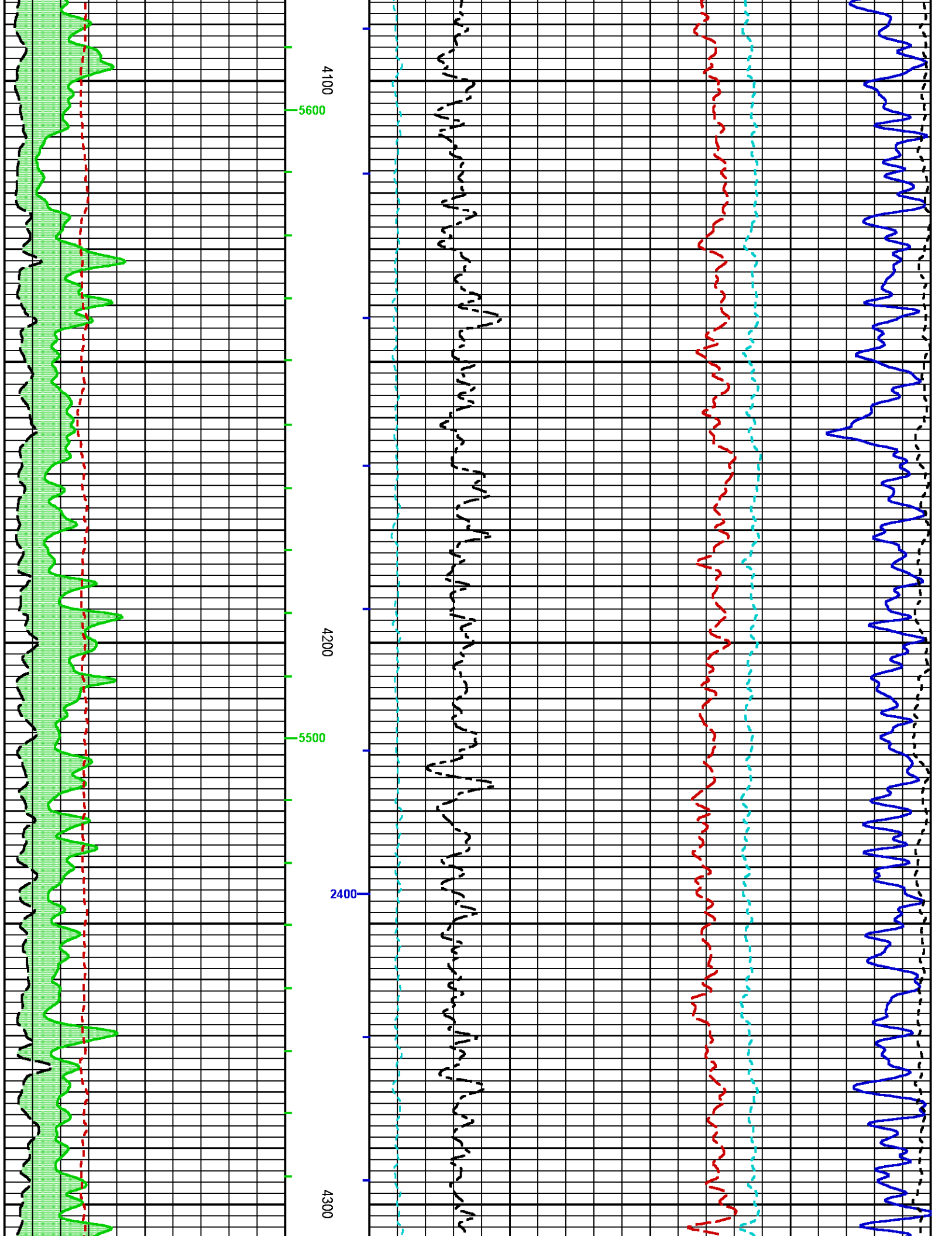


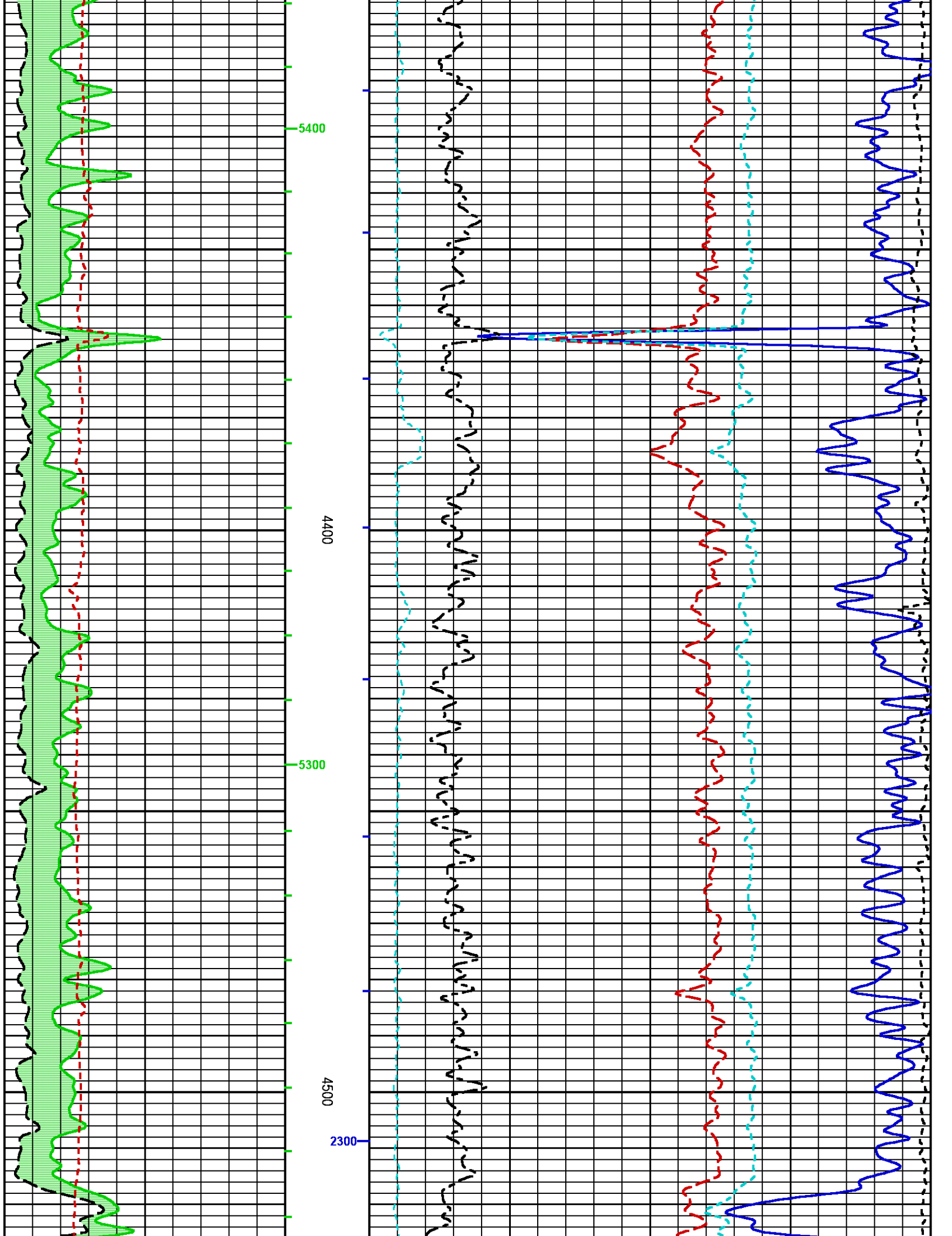


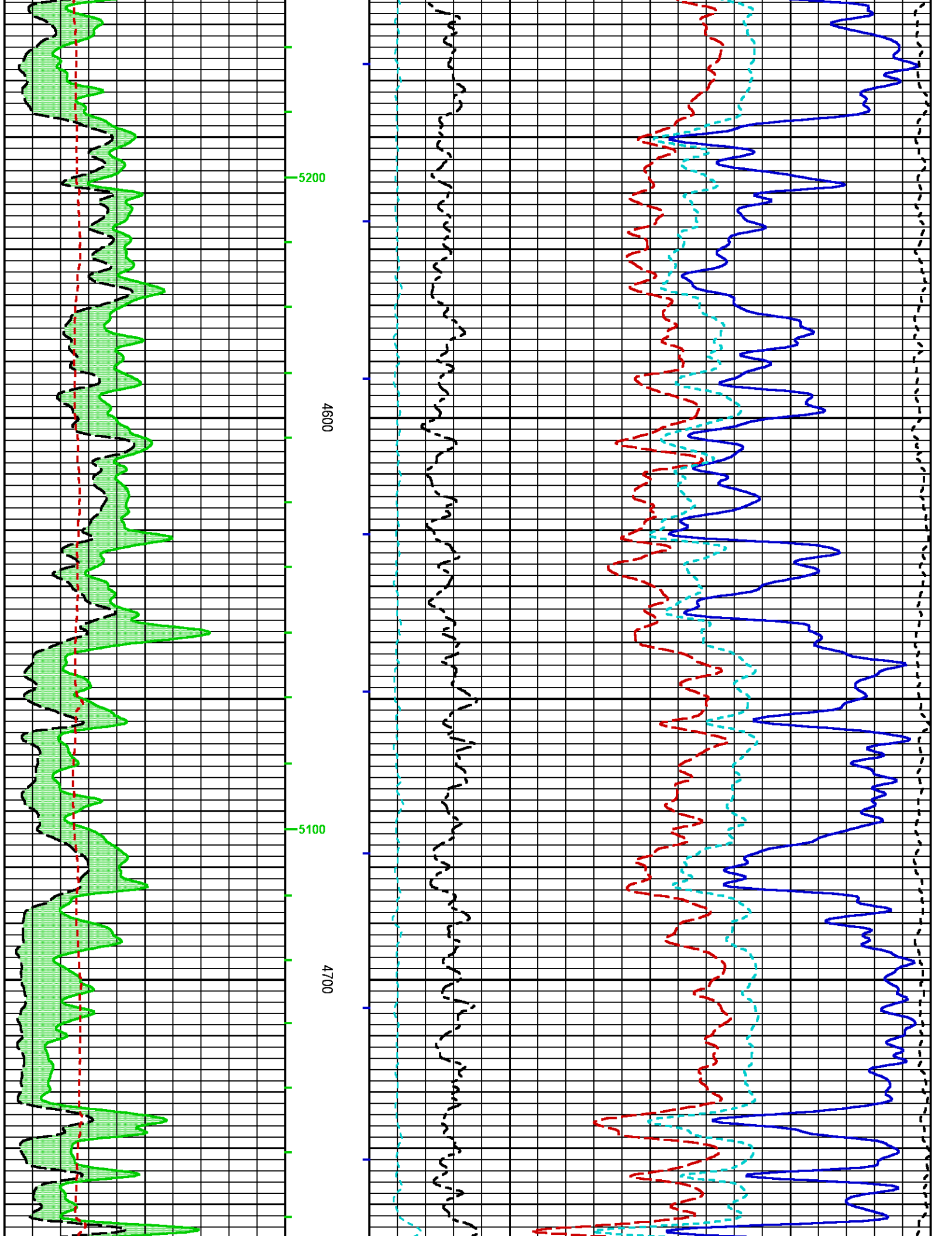


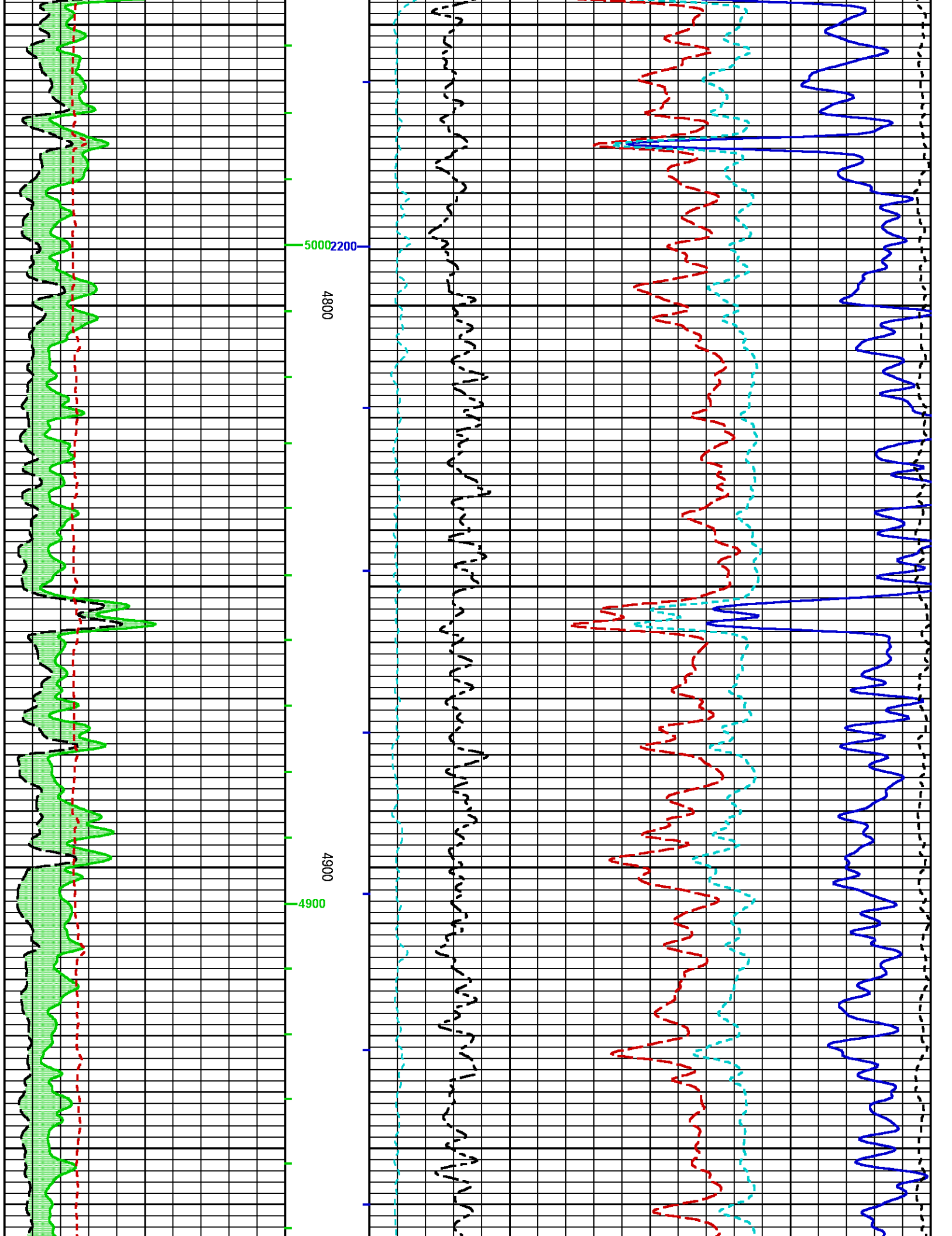


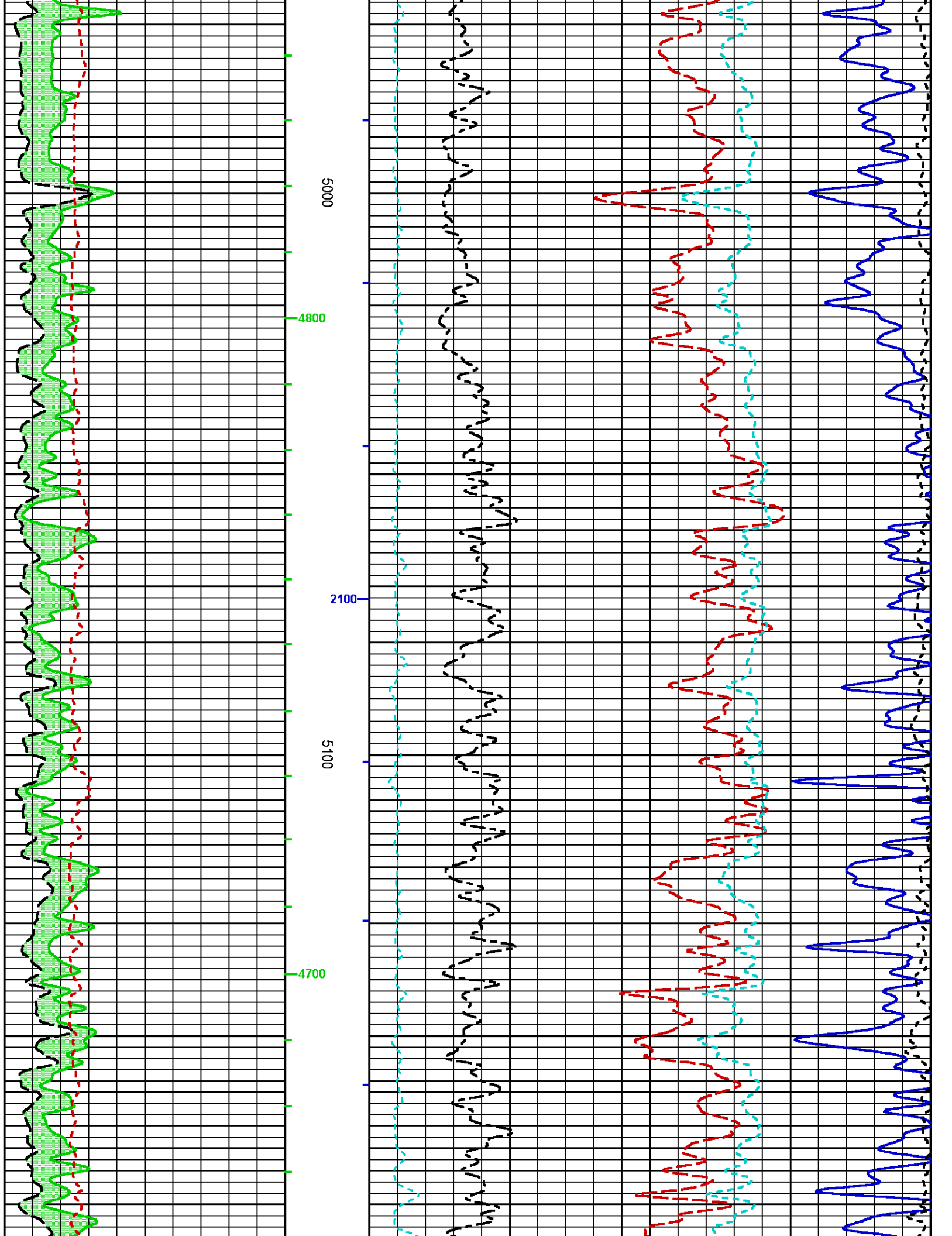


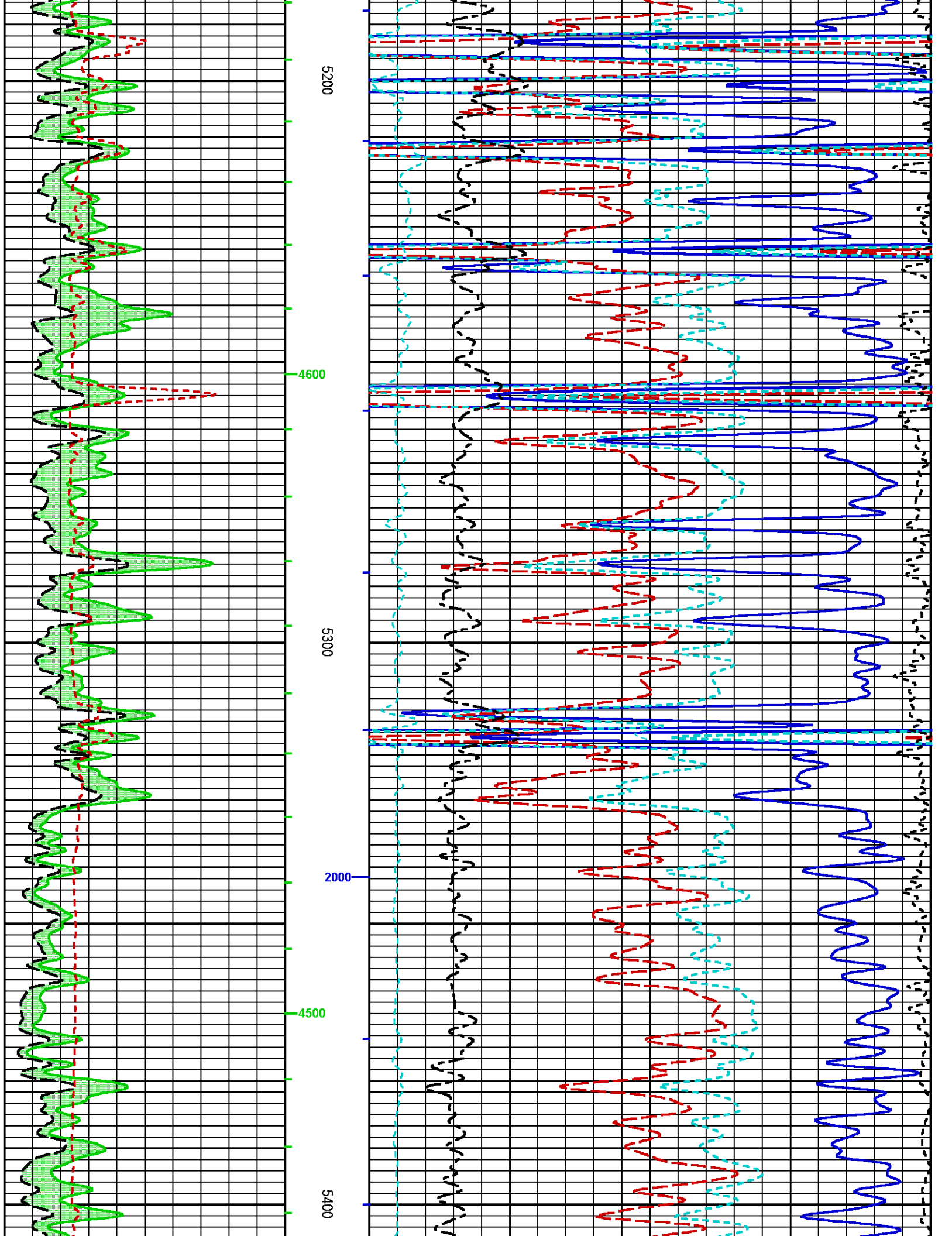


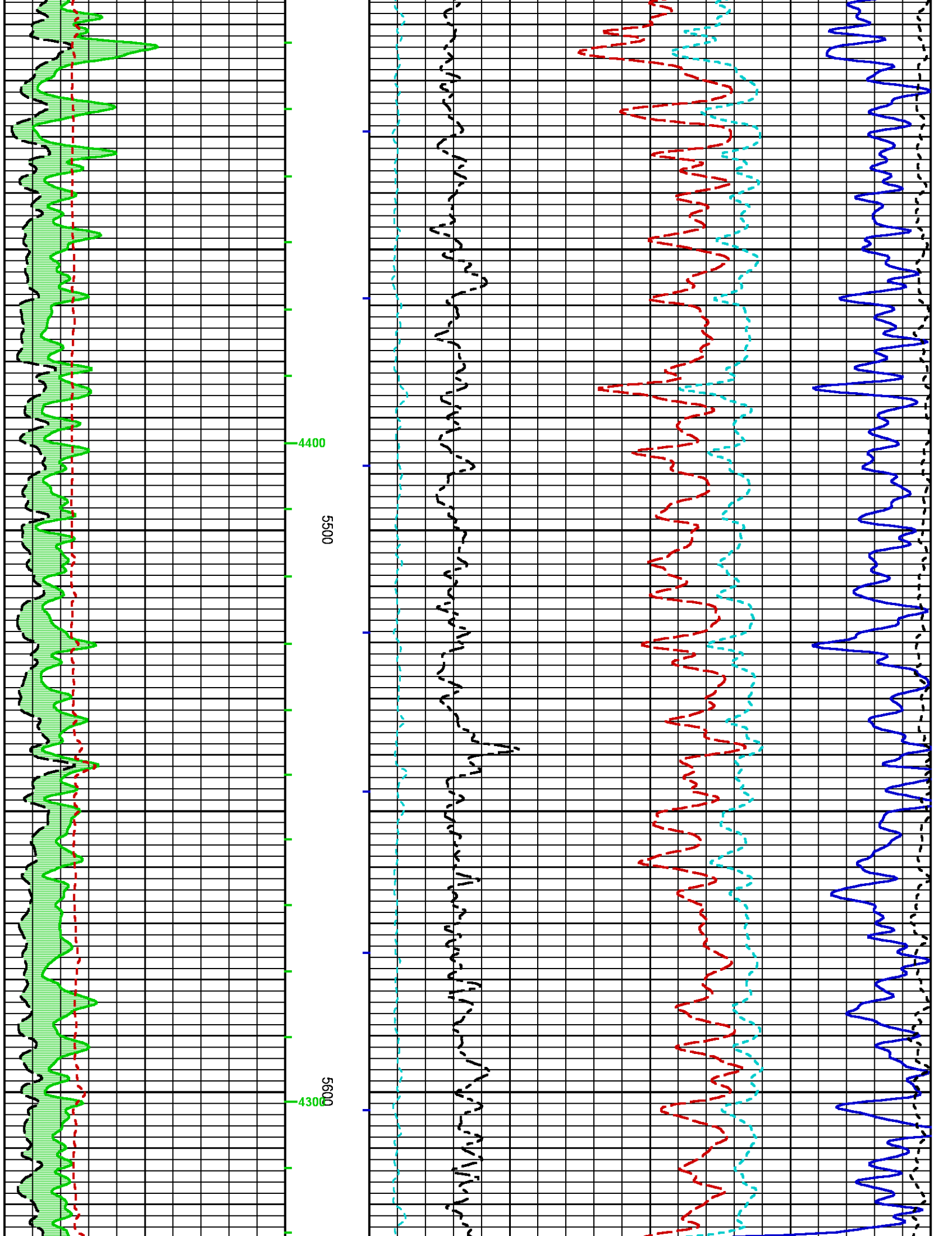


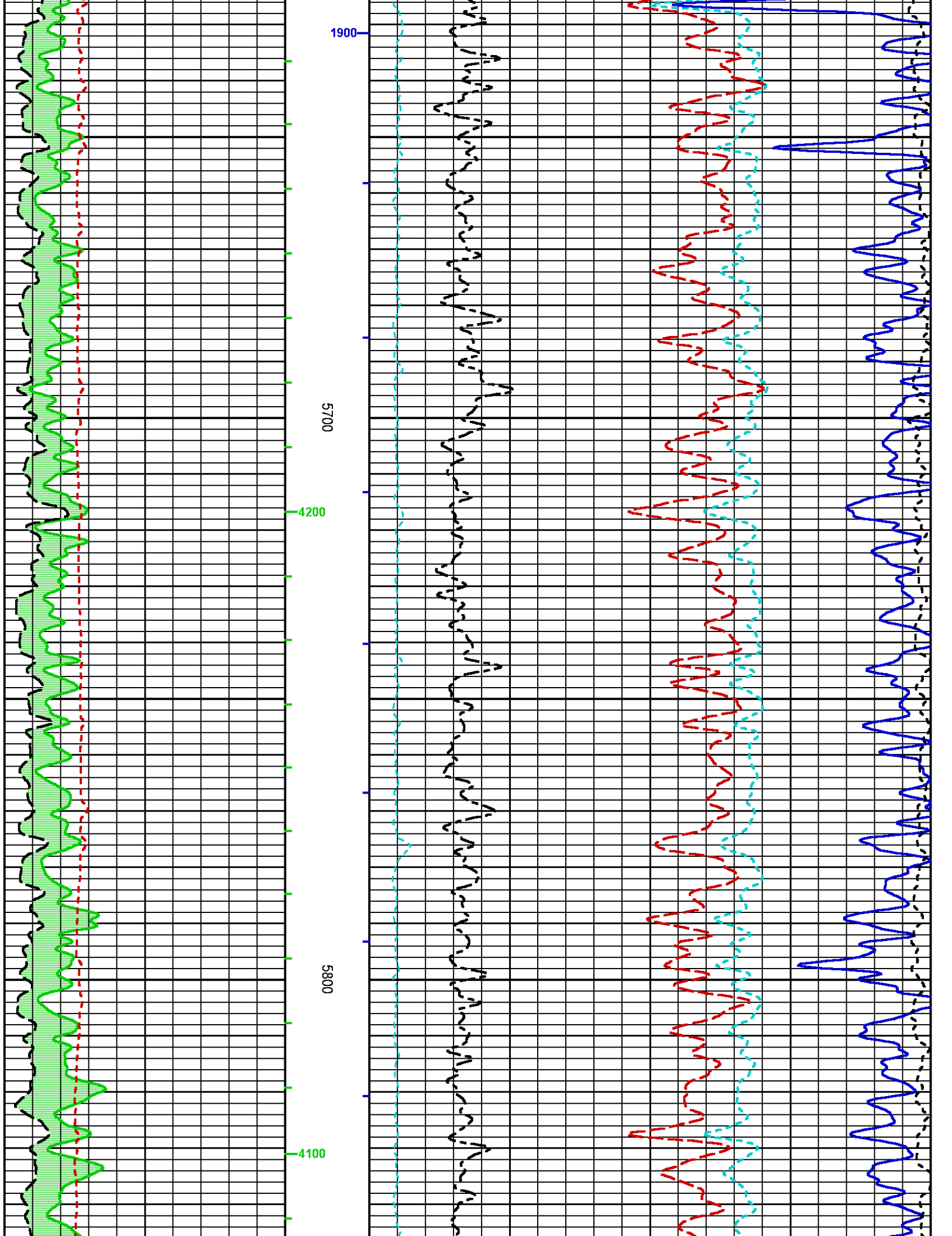


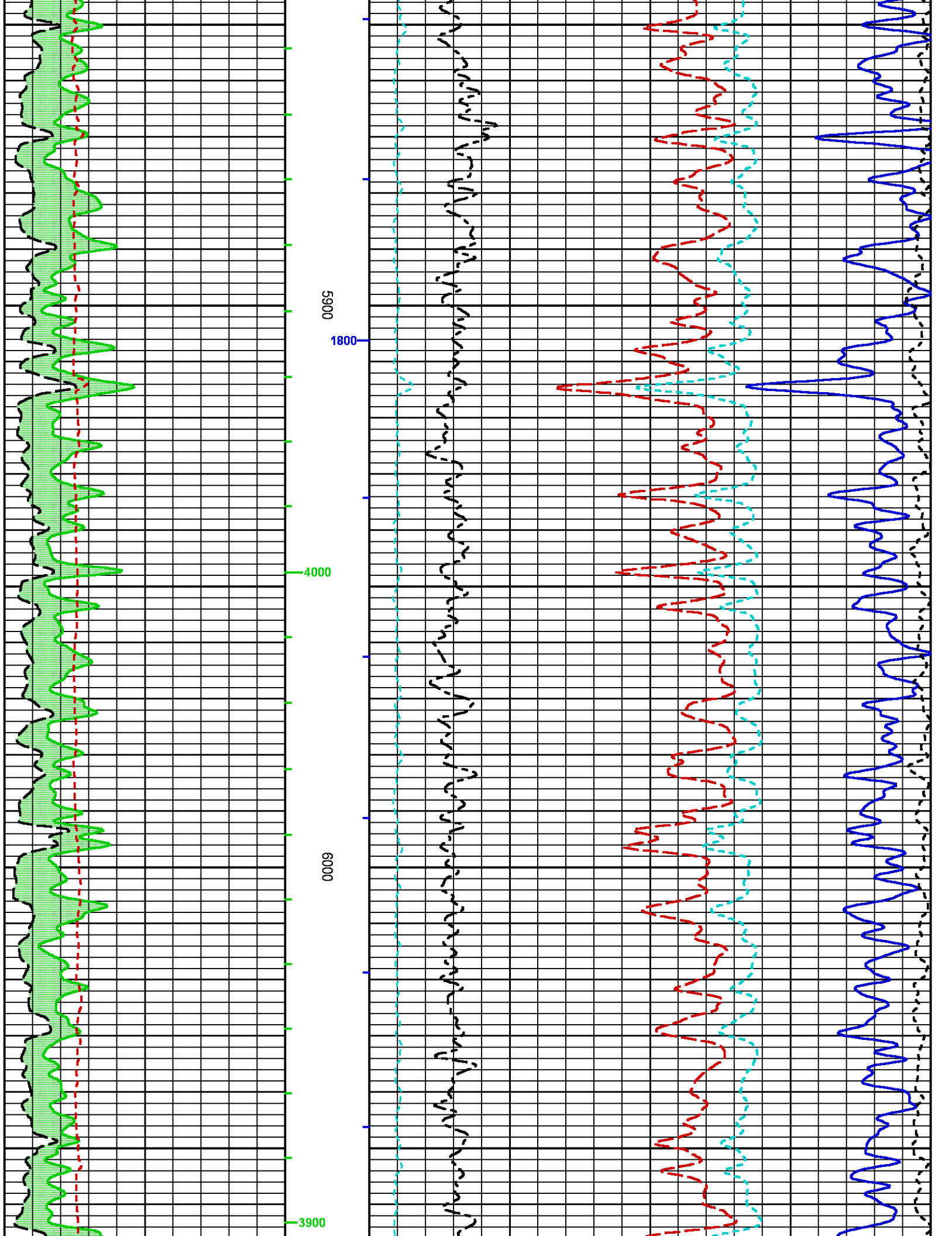


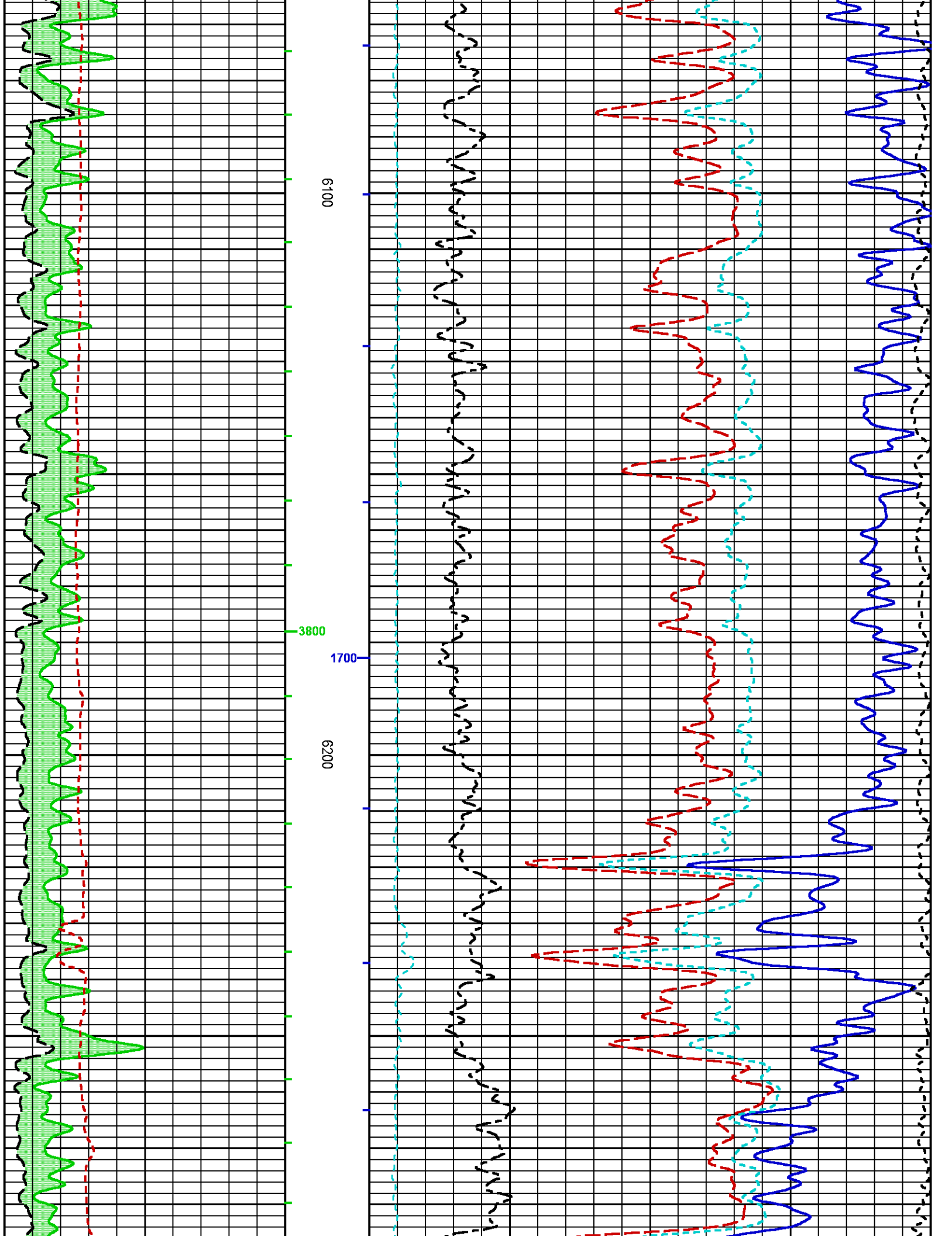


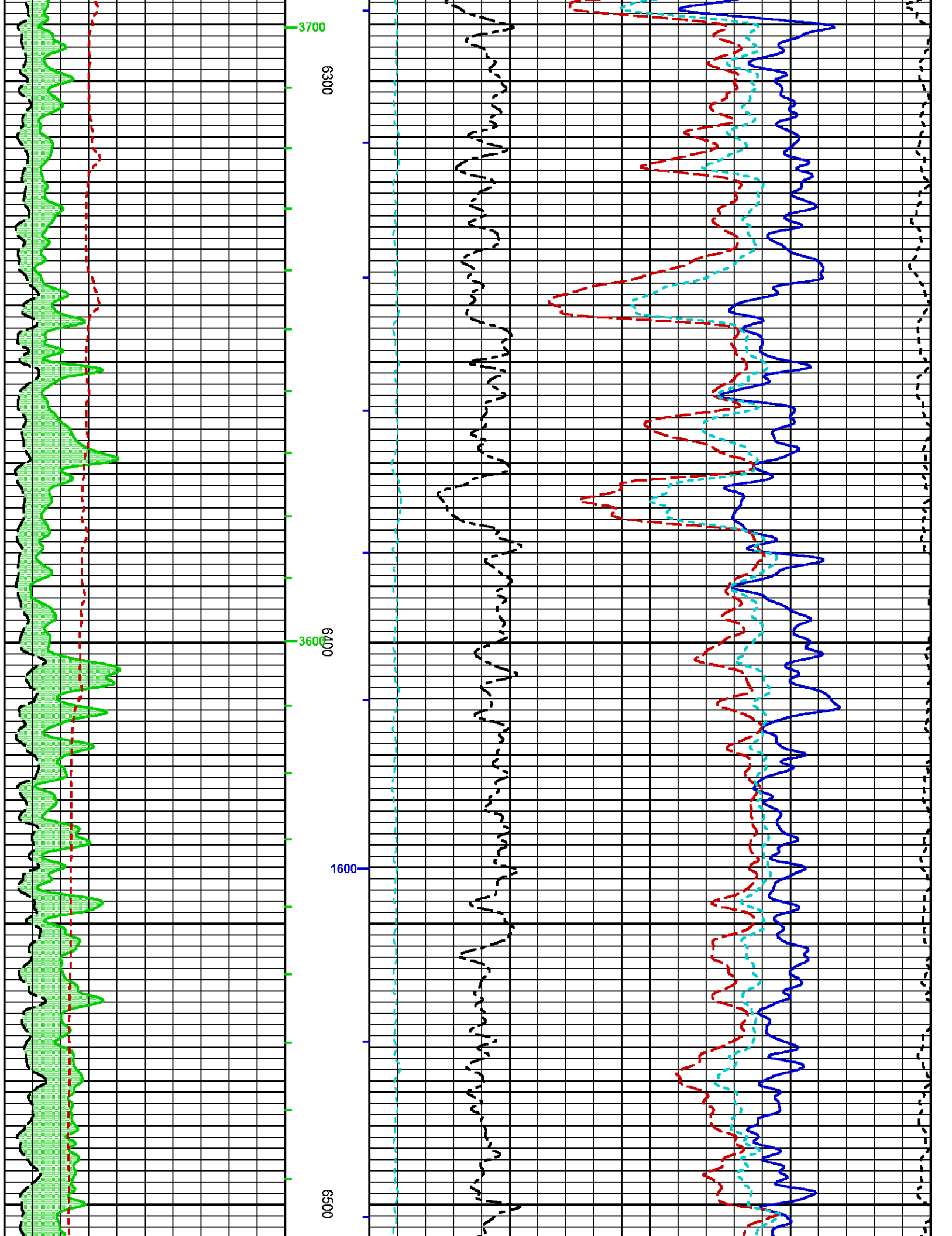


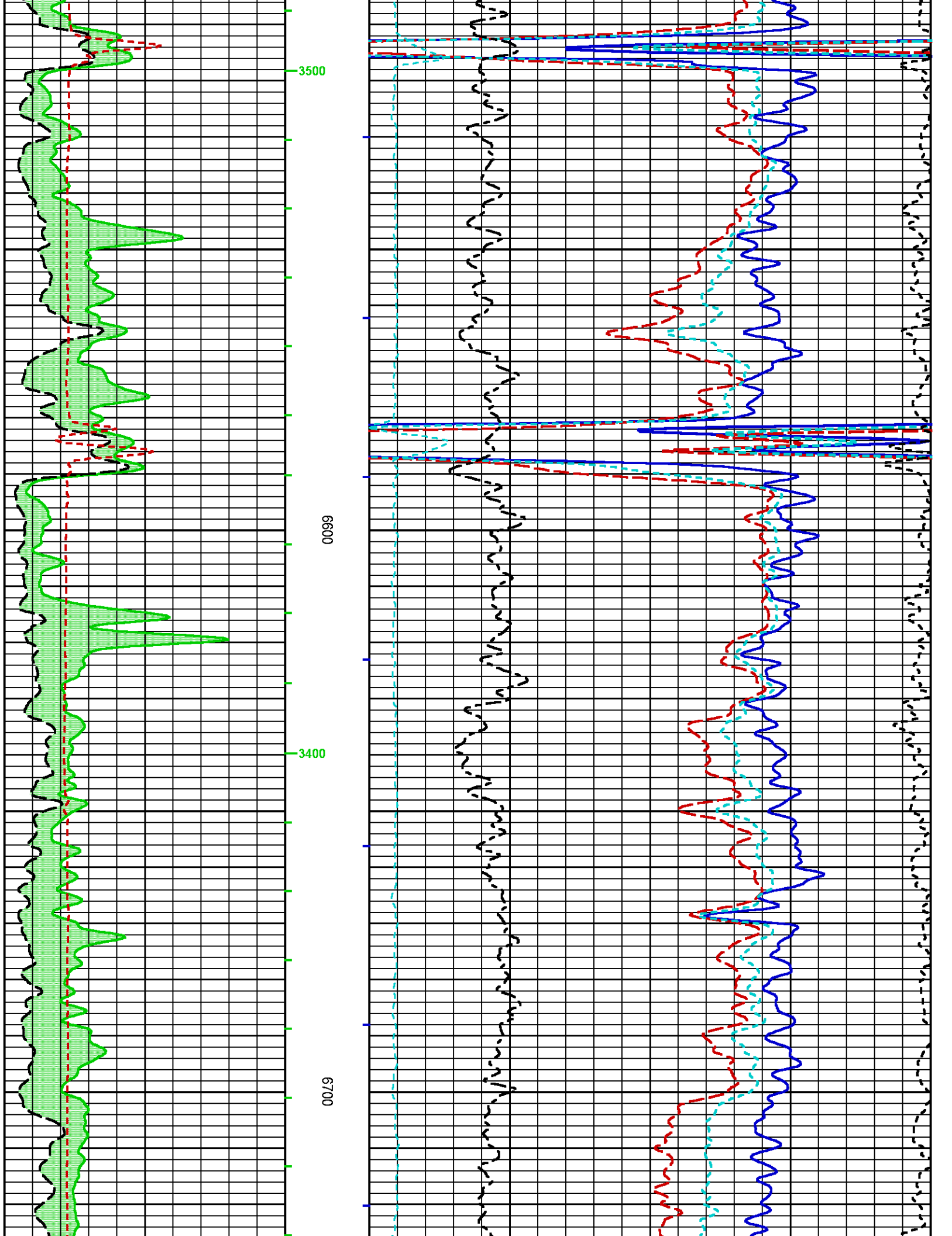


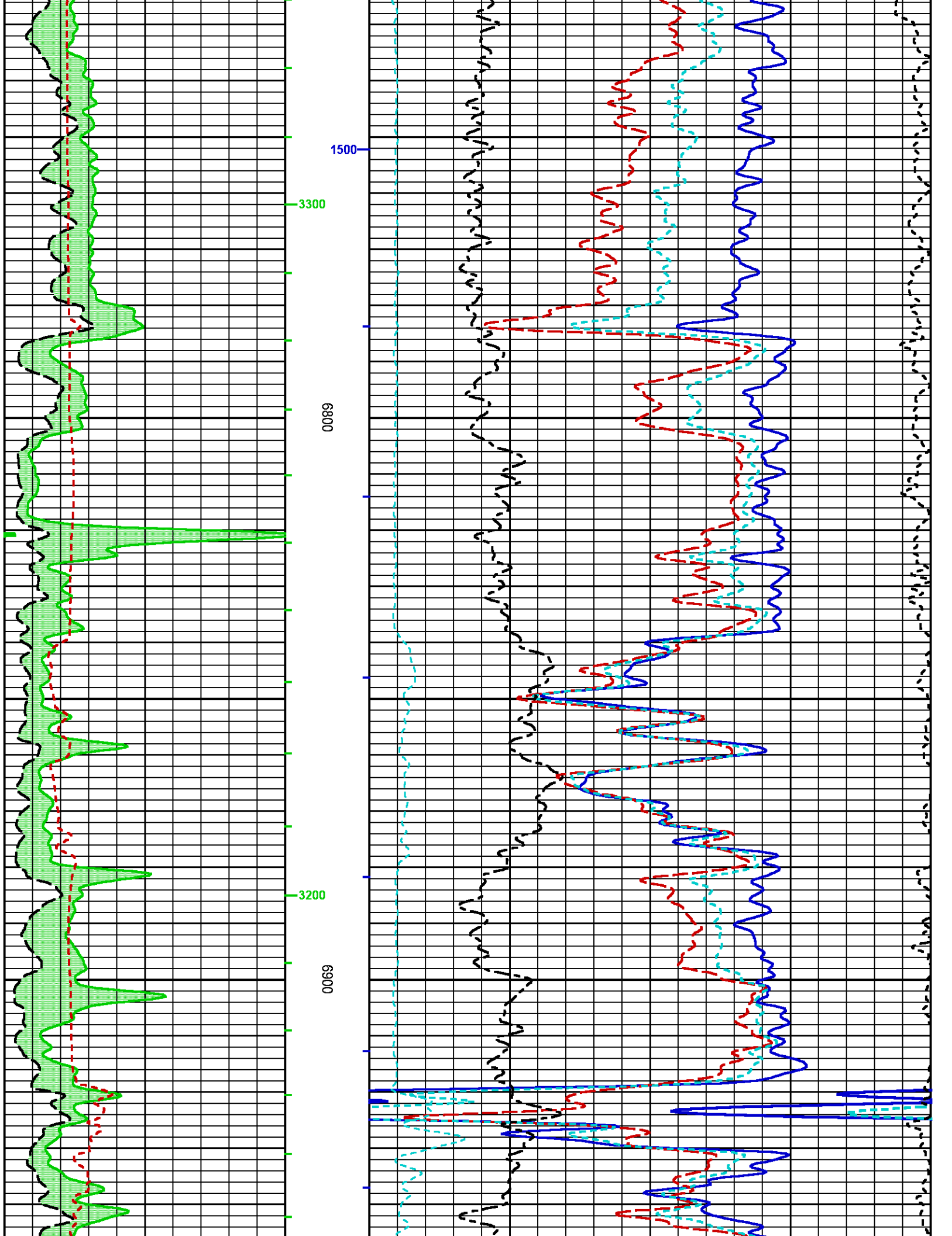


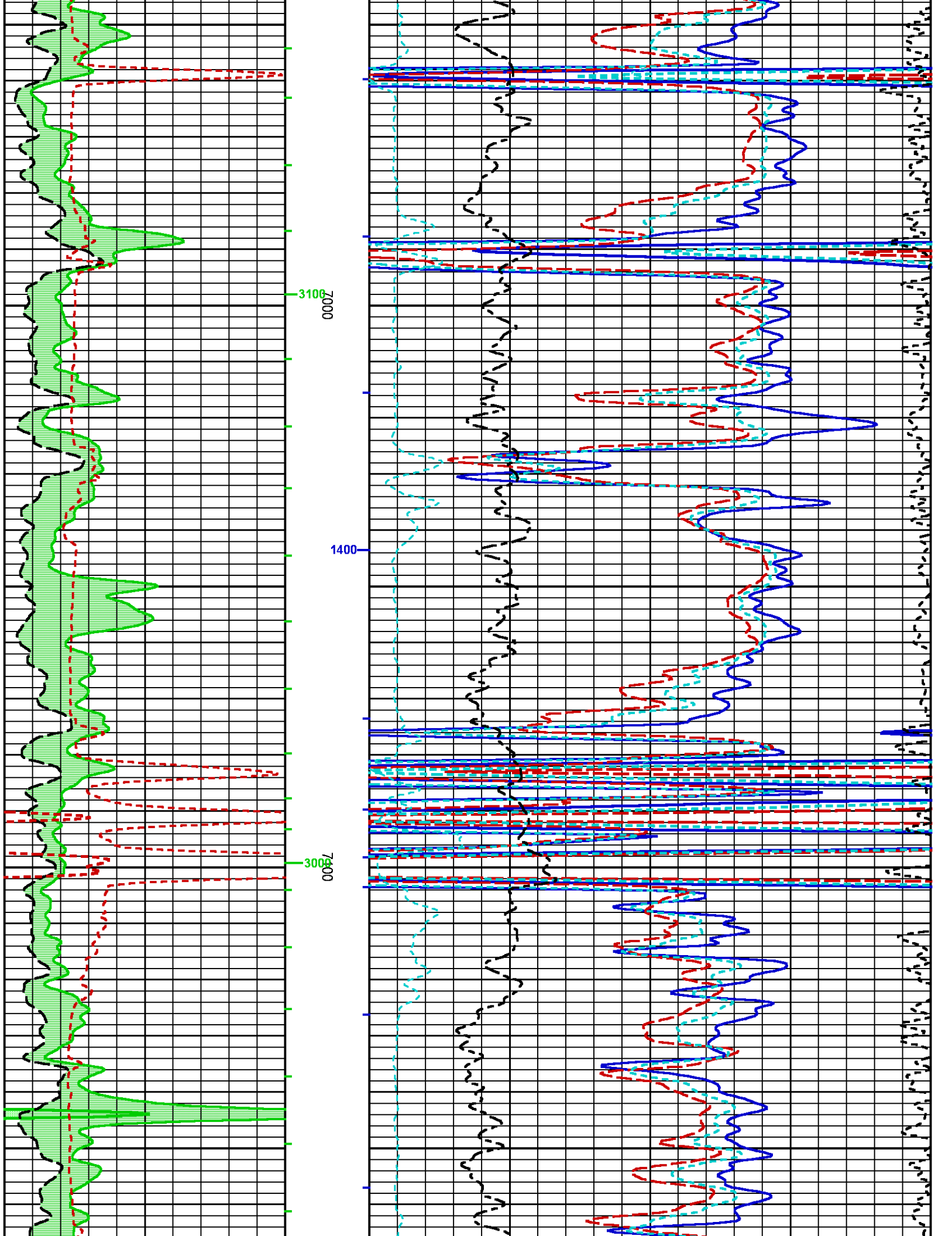


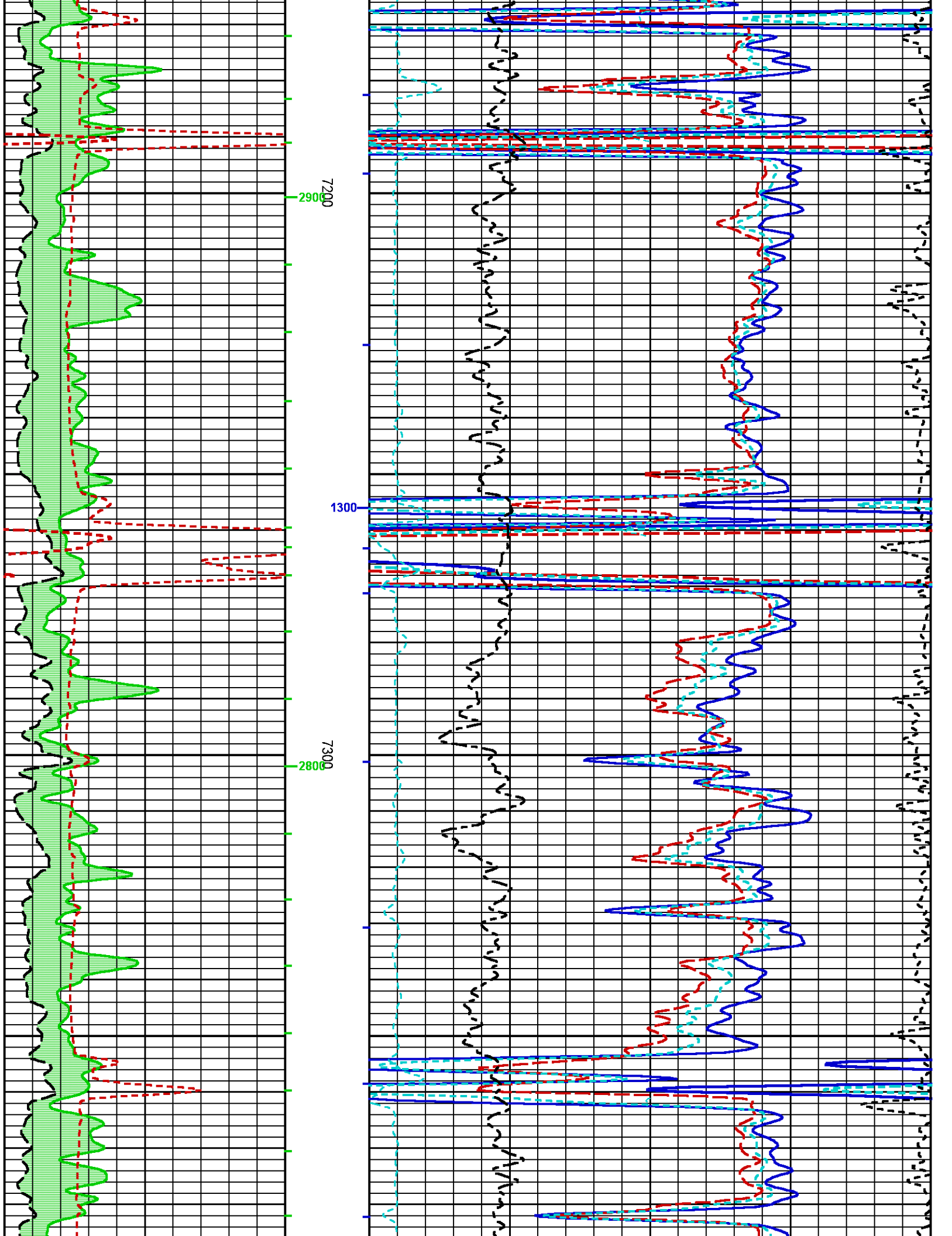


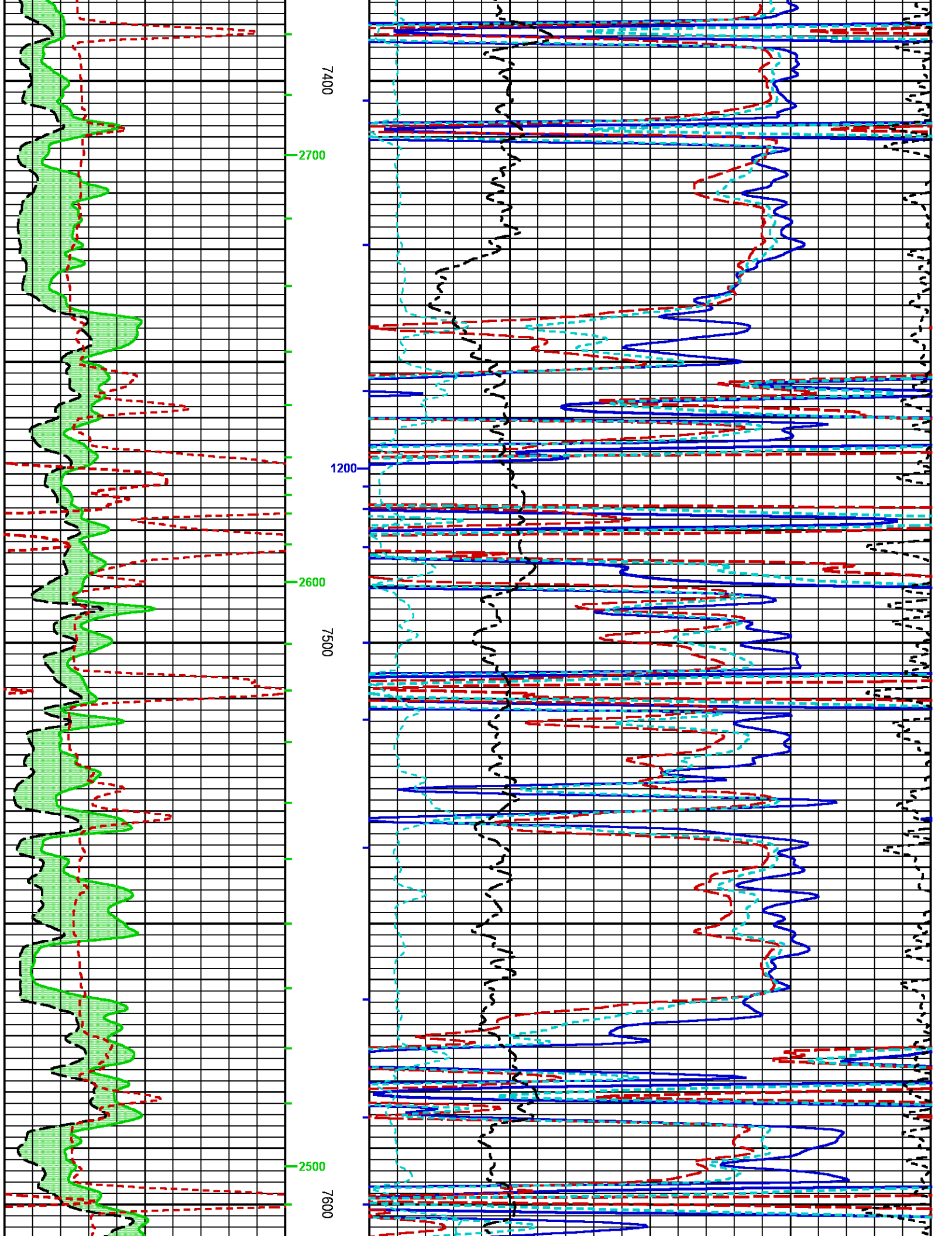


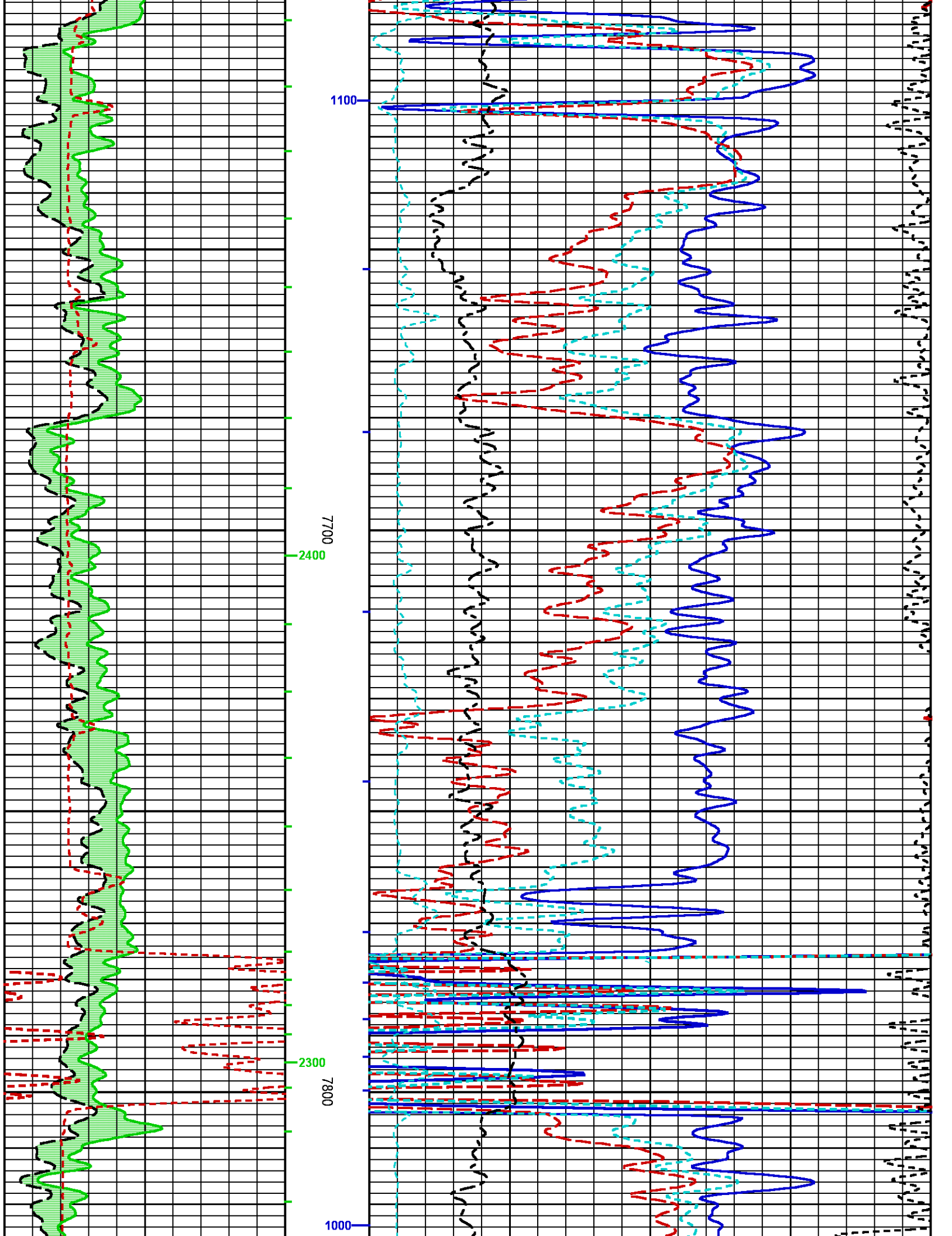


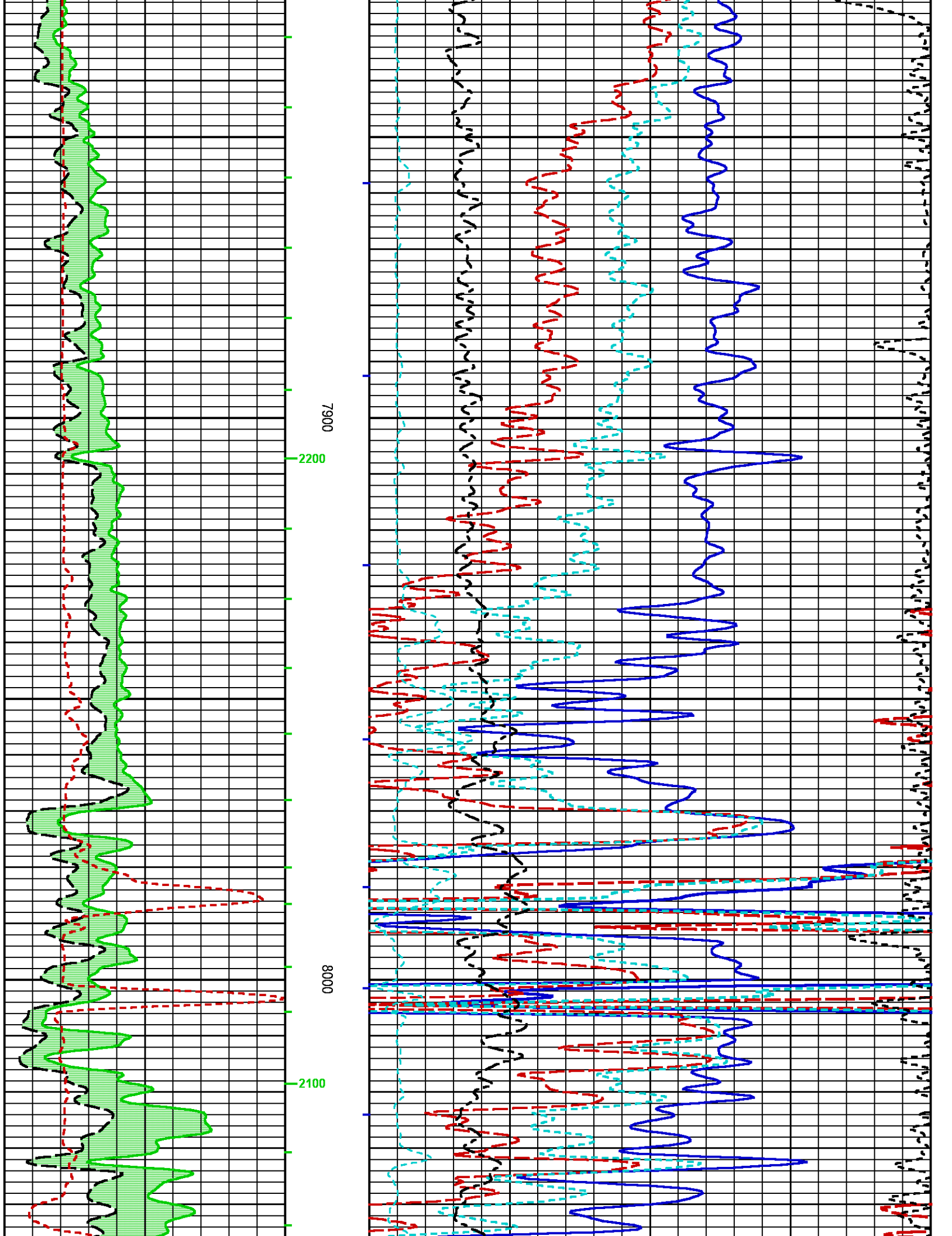


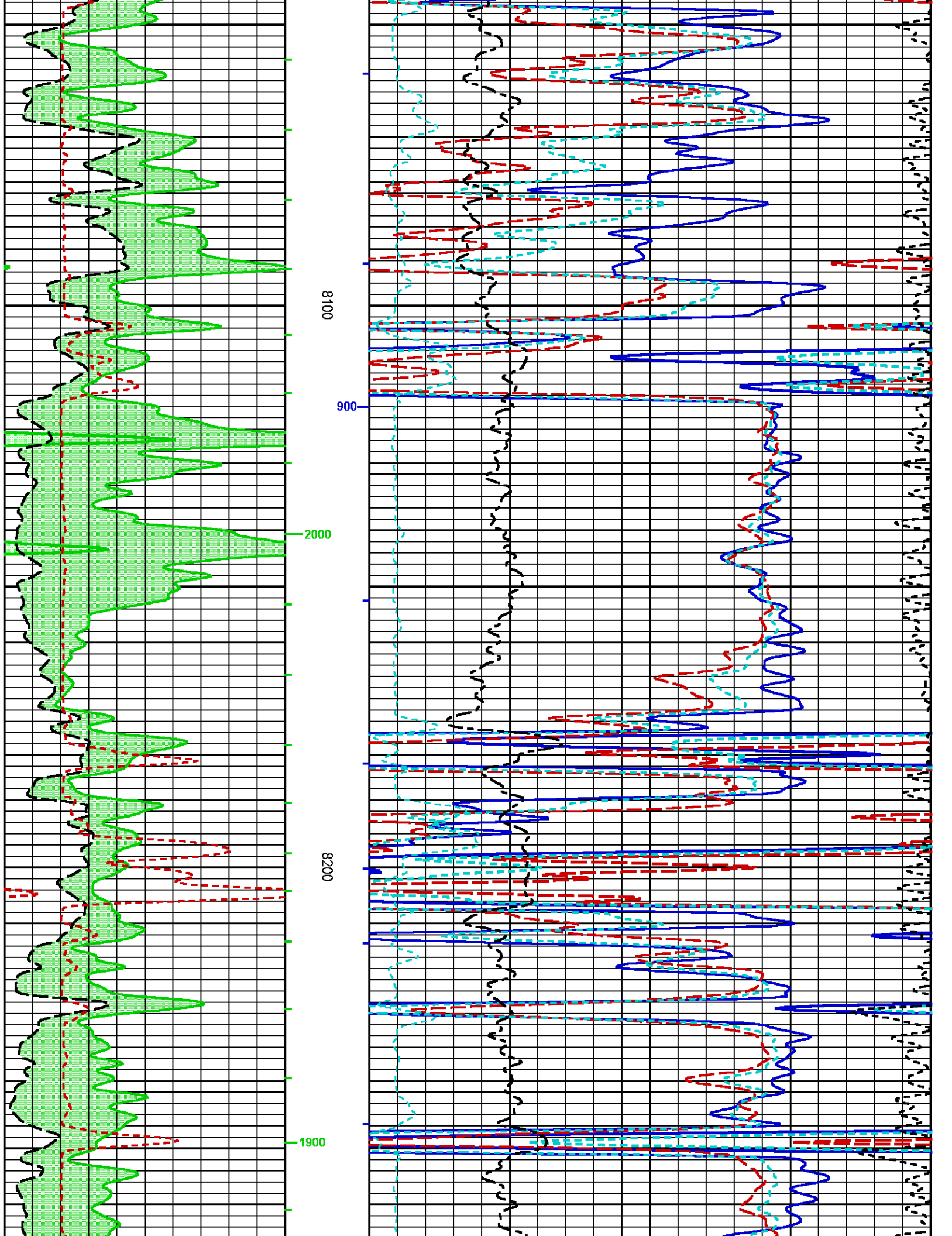


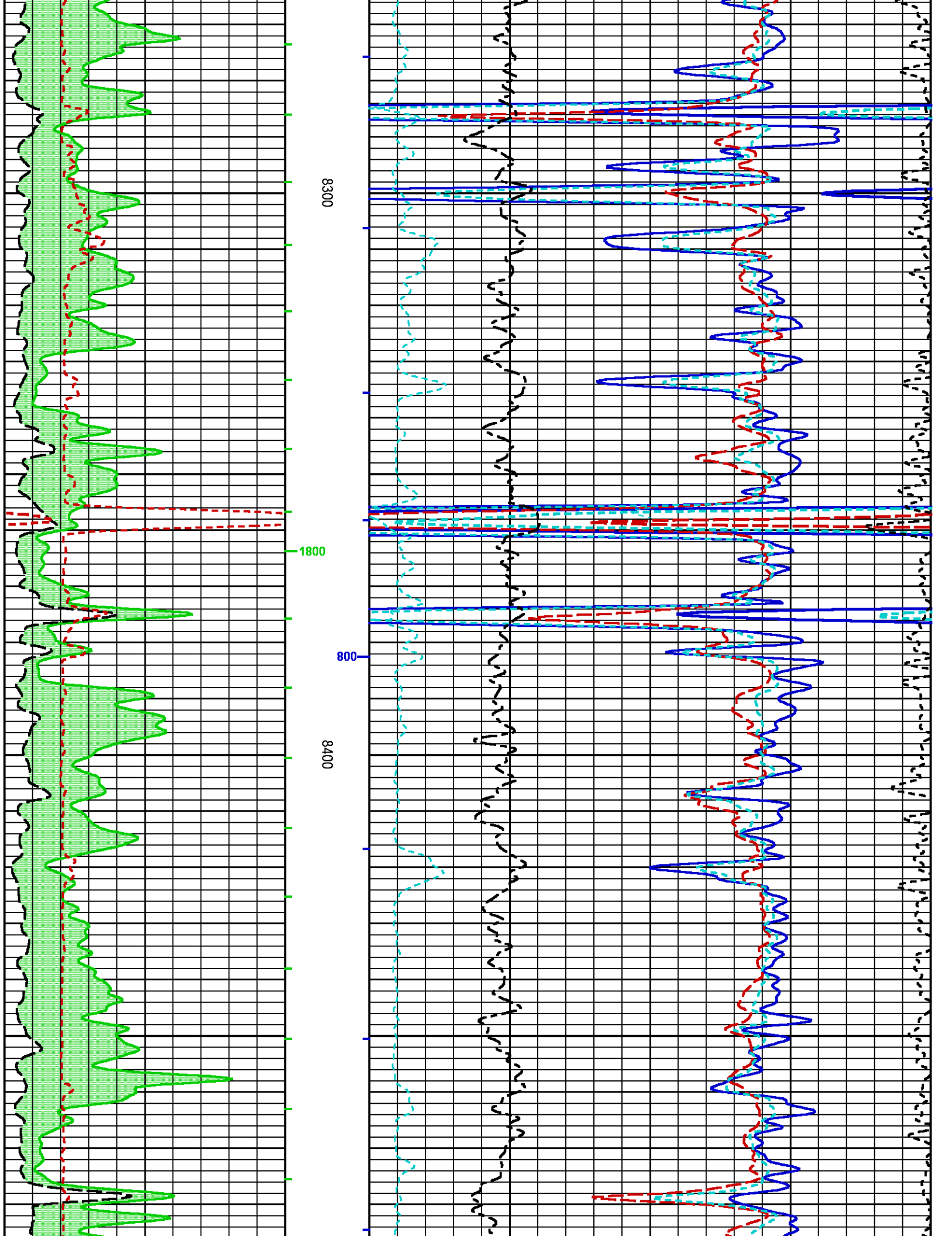


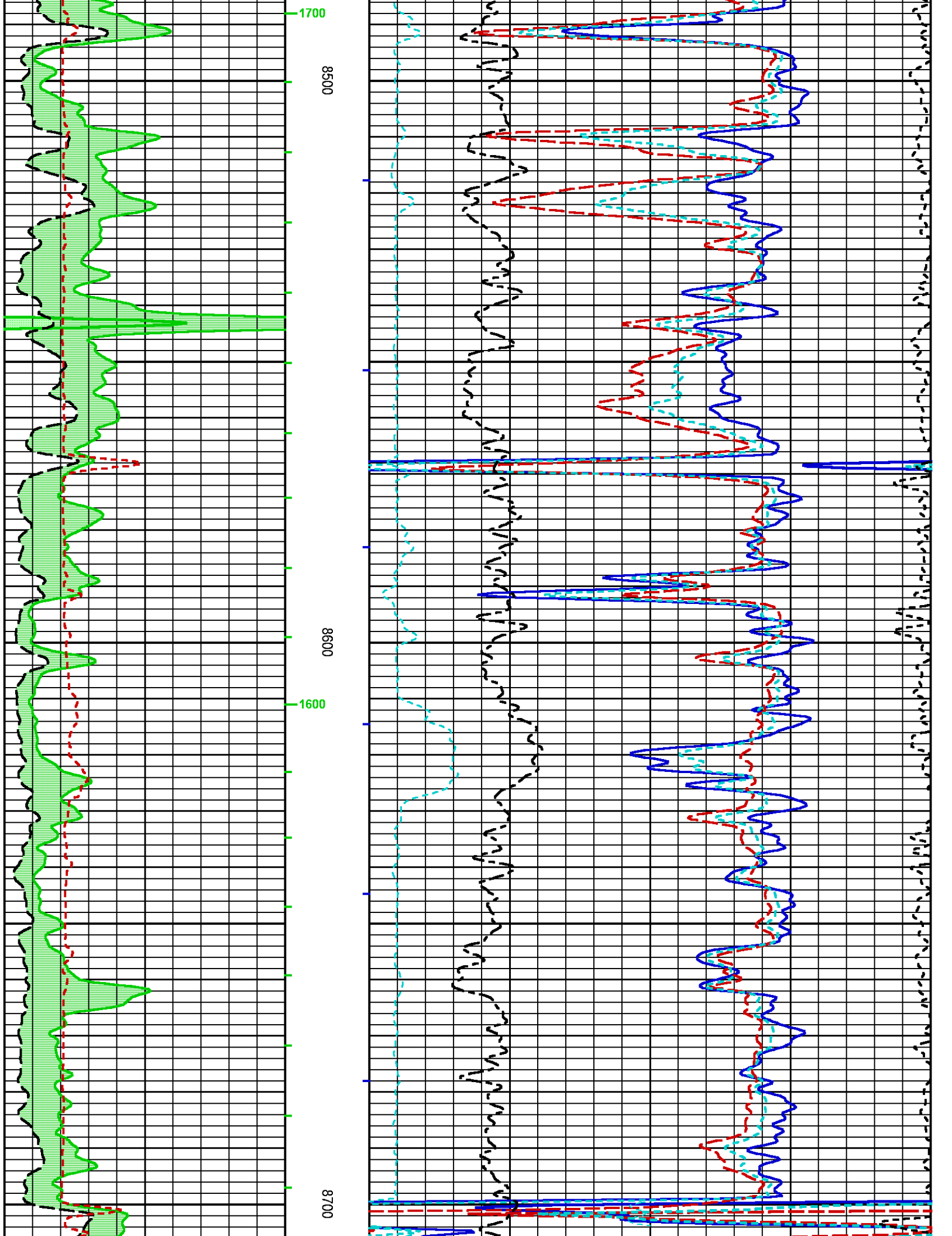


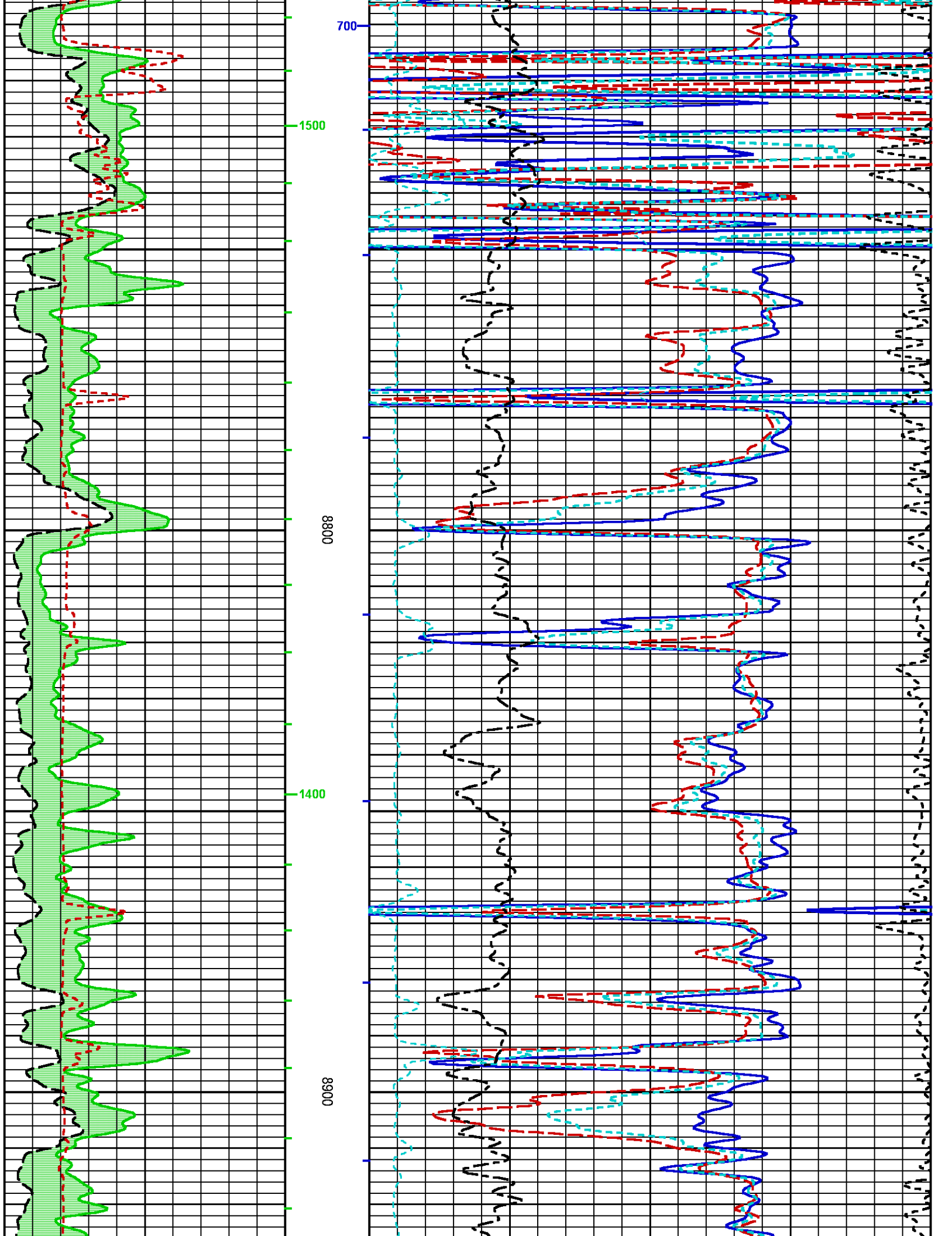


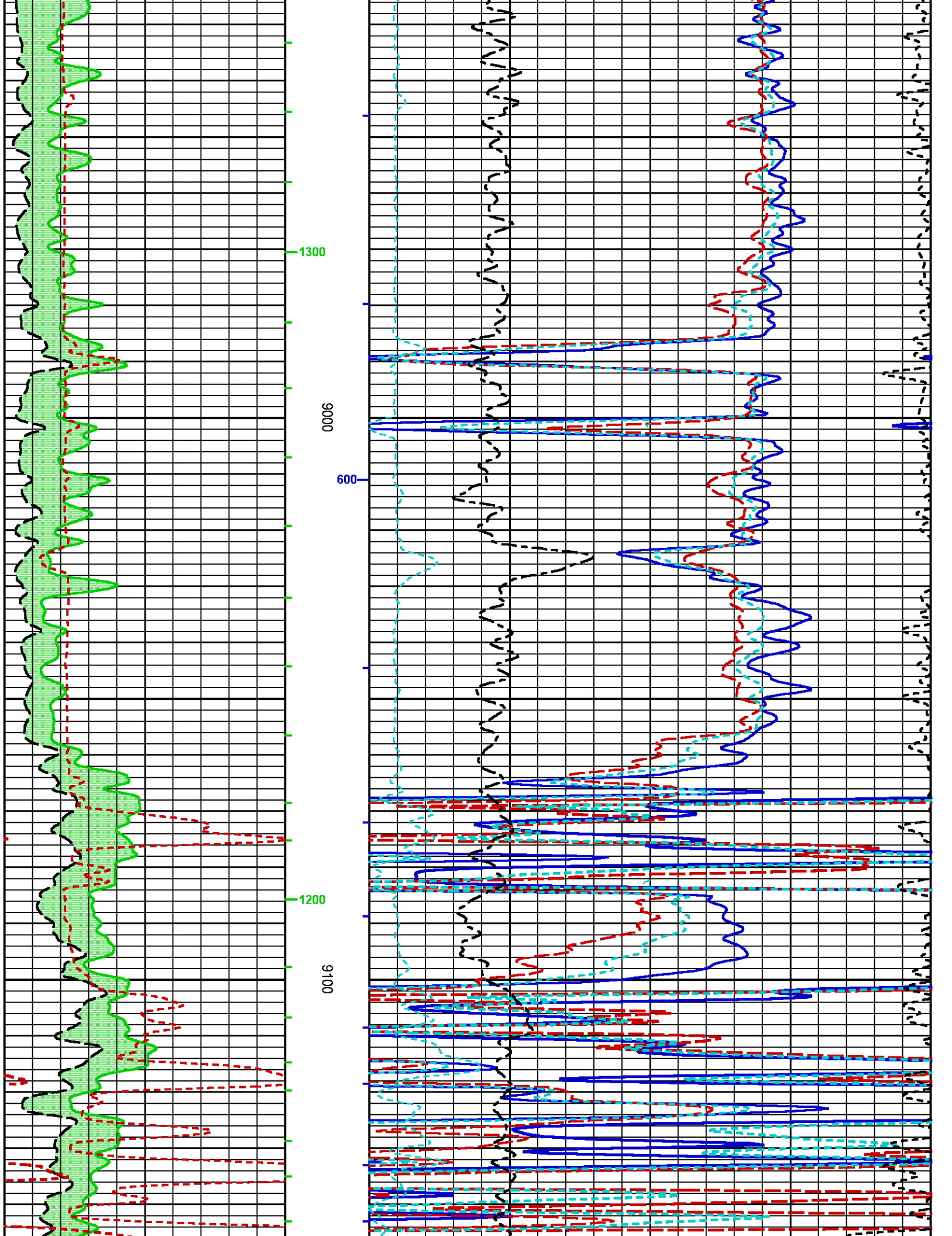


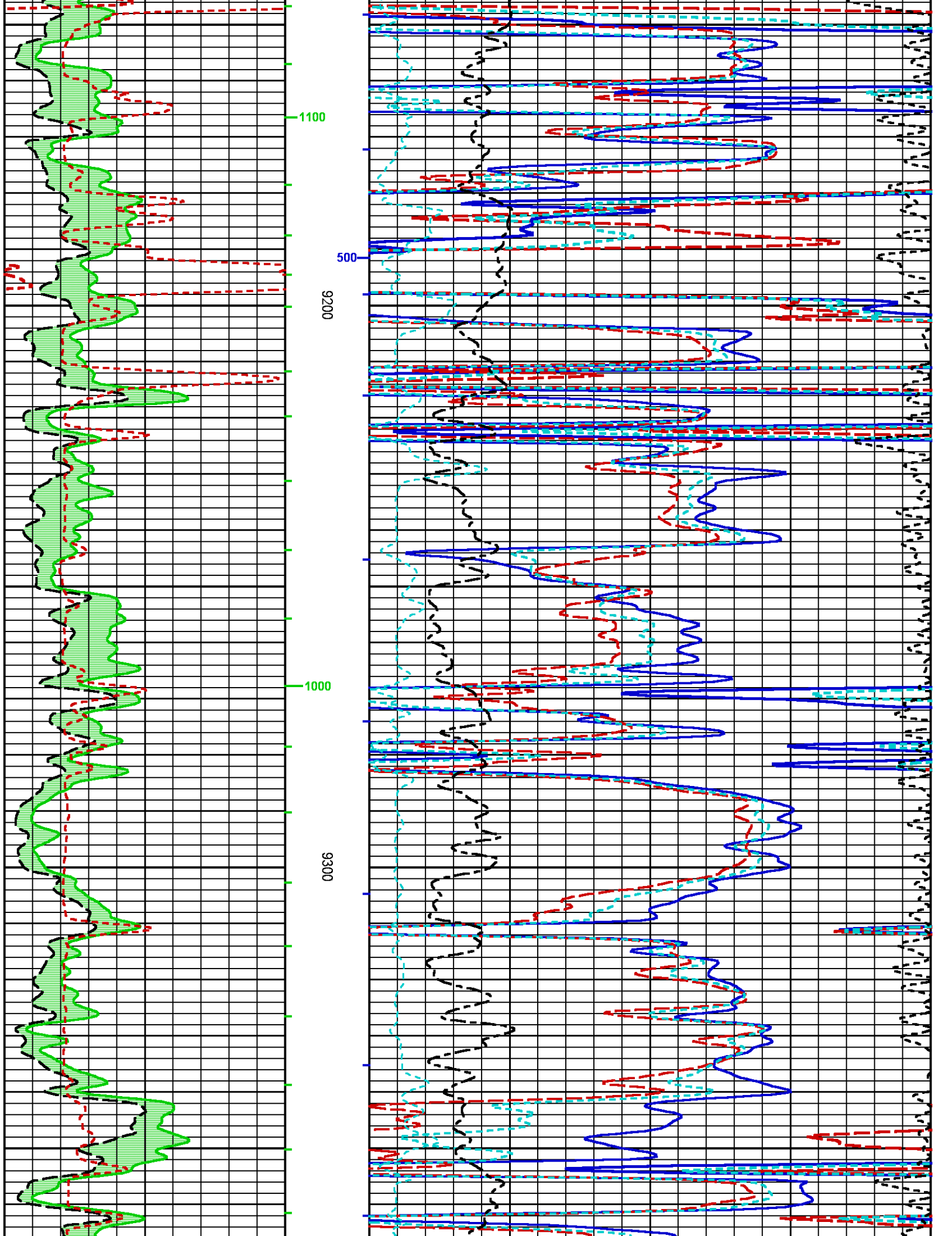


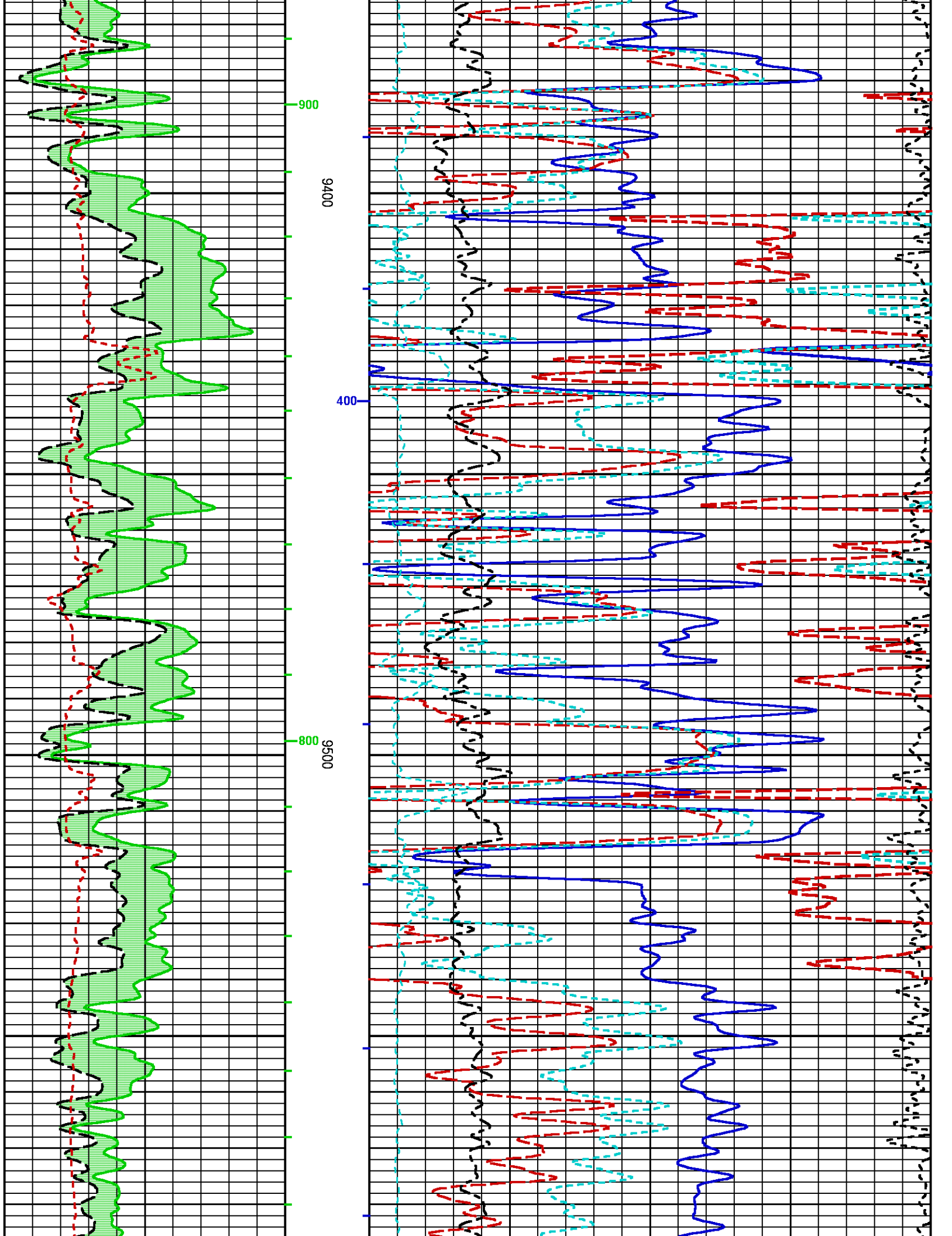


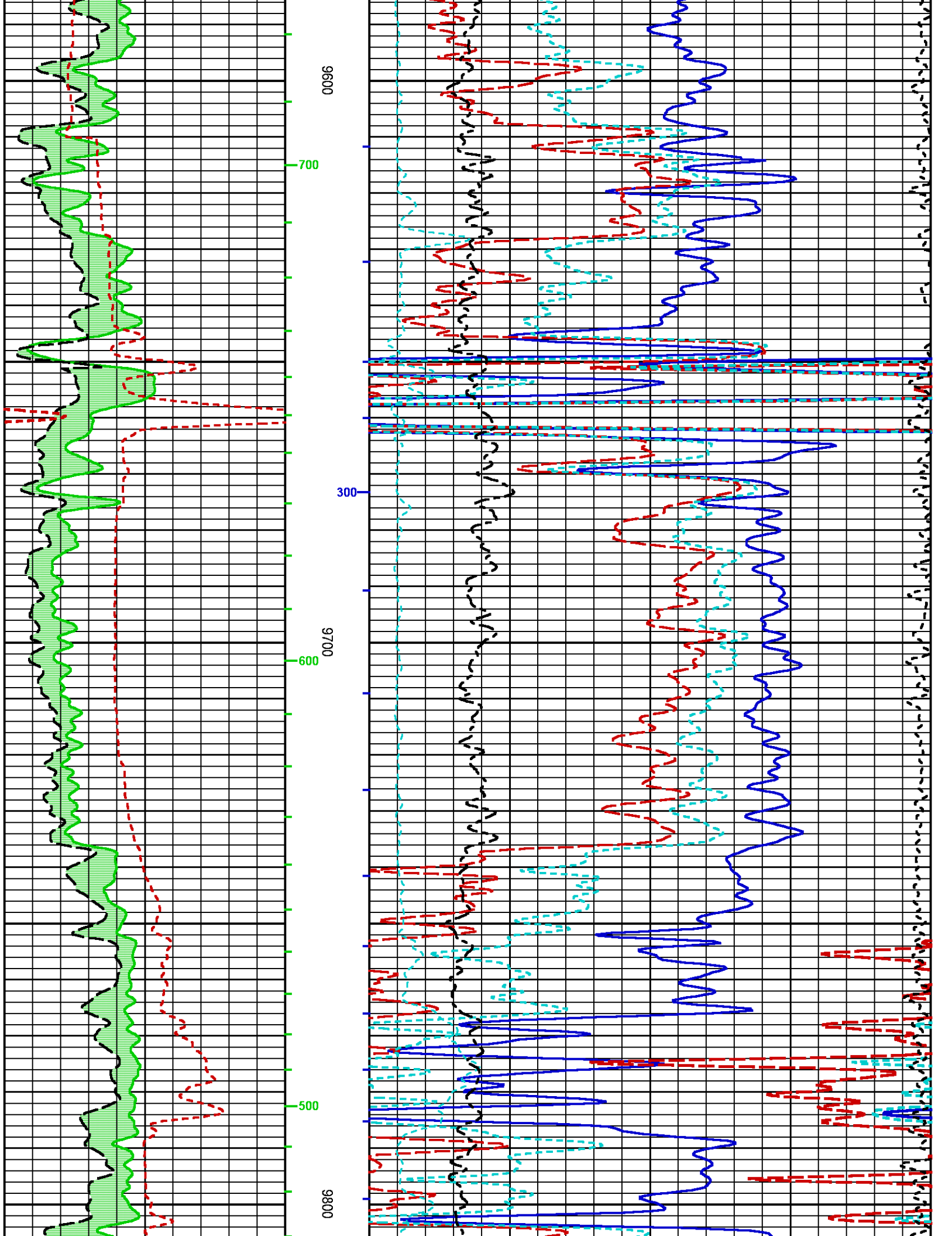


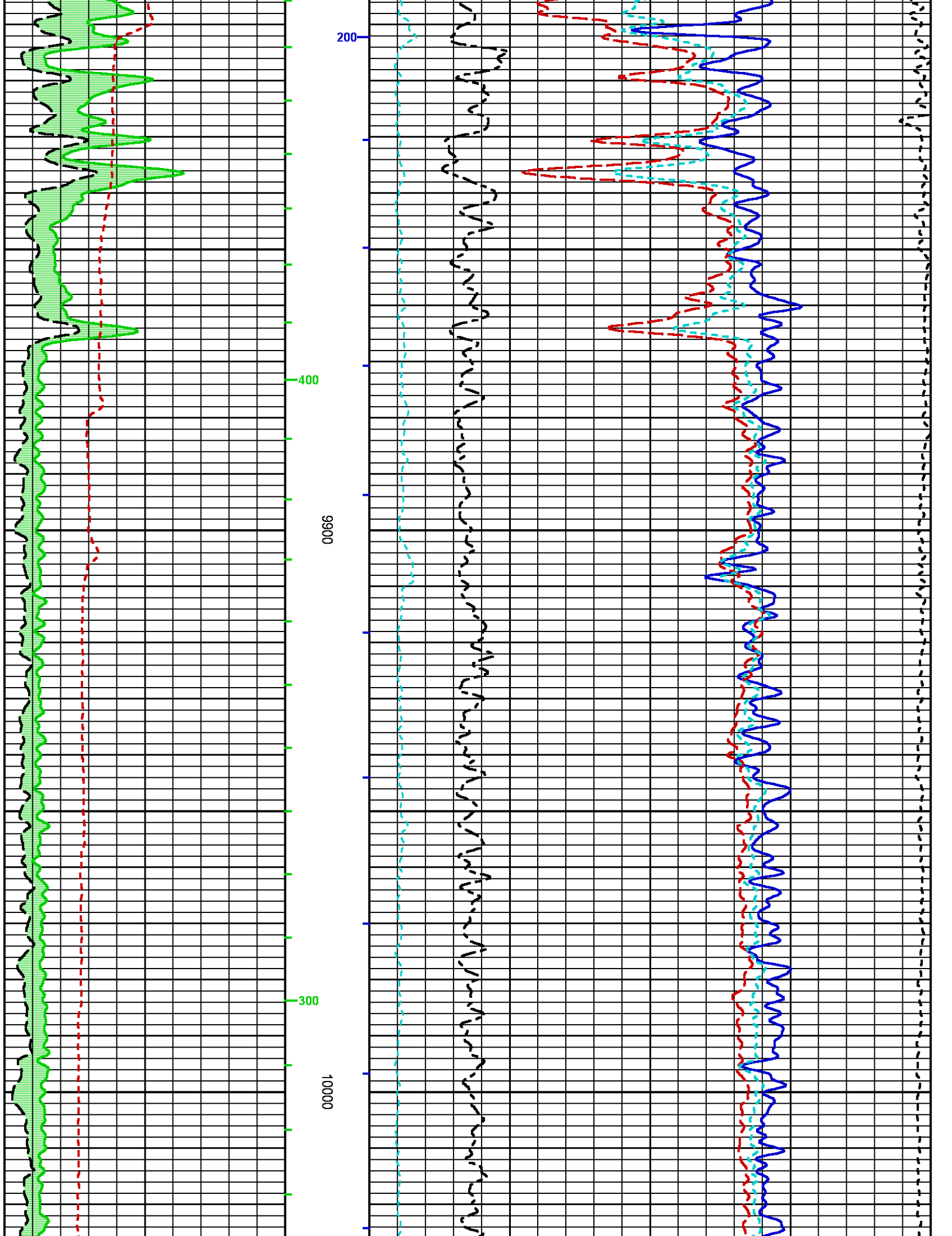


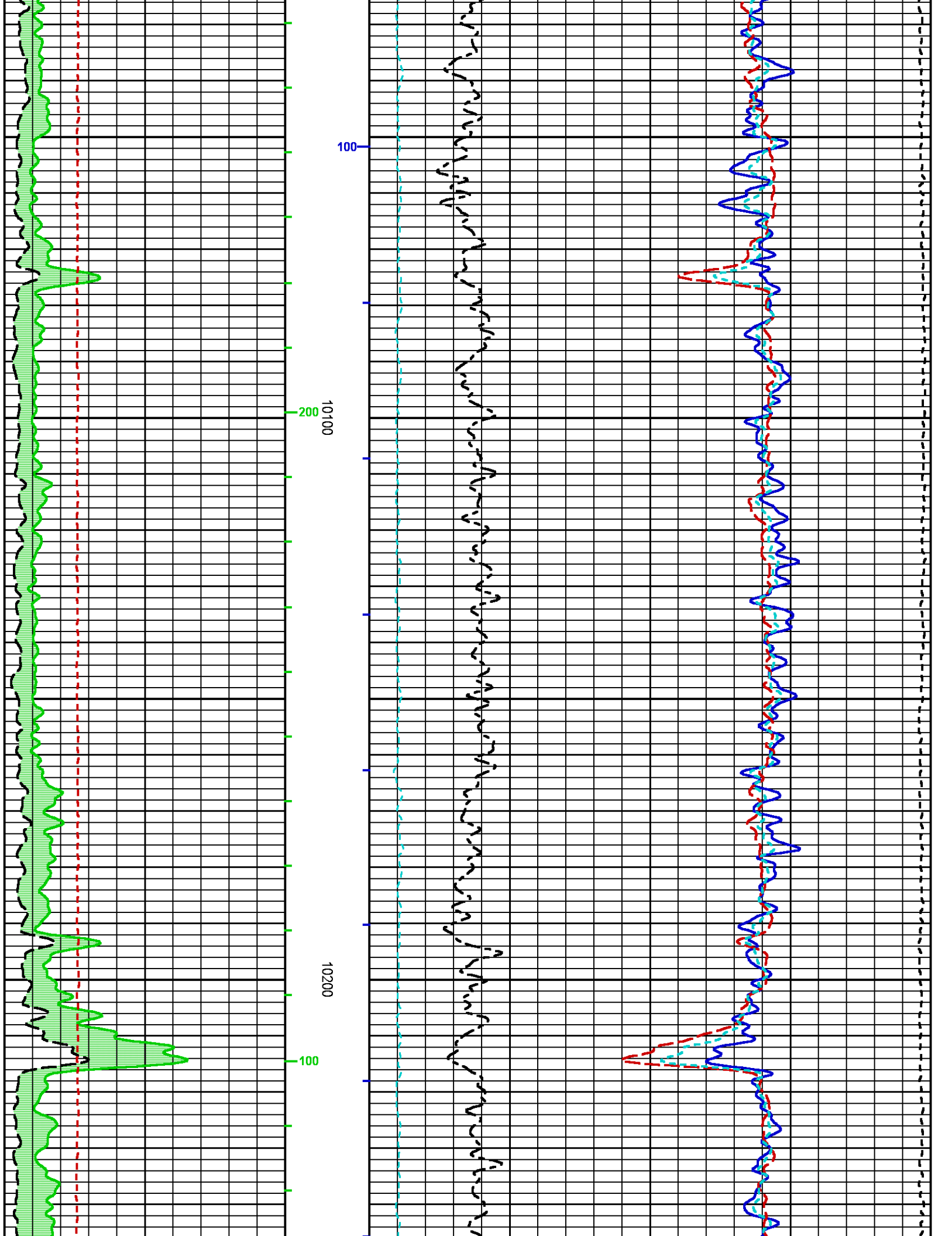


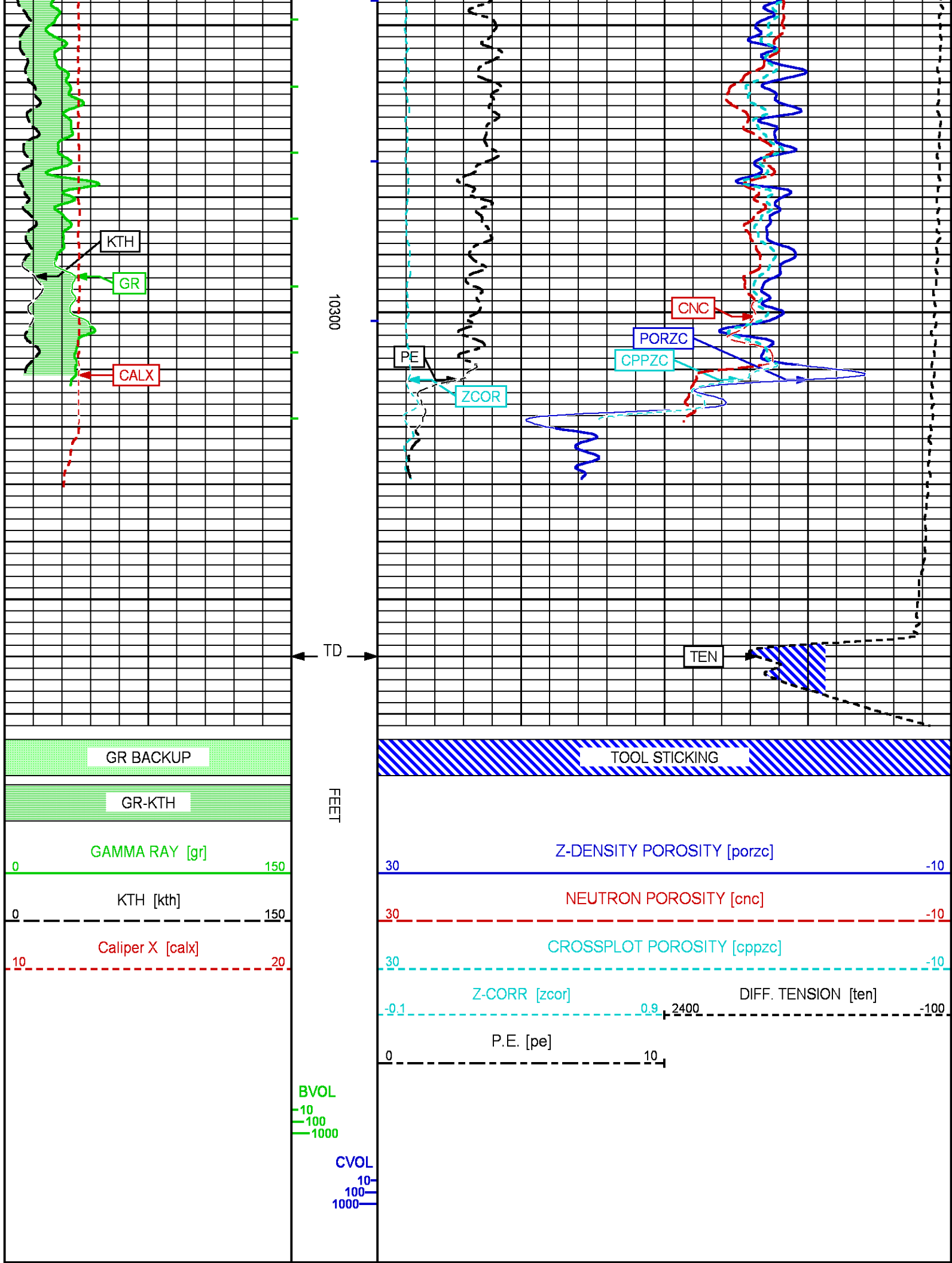












REPEAT LOG 5"/100FT SCALE

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017

Updates: 32 Patches: 4

Plotted: Fri Jun 29 10:43:46 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/md11798R3/p87cc06.prm
 LOGGING MODE: DEPTH DIRECTION: UP
 TOP DEPTH: 10130.750 ft BOTTOM DEPTH: 10377.550 ft

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
TENSION	FILTER ()	medium (1)		TOP	BOTTOM
GR	FILTER ()	medium (1)		"	"
SL	FILTER	medium (1)		"	"
CN	FILTER ()	medium (1)		"	"
CALIPER	FILTER ()	medium (1)		"	"
ZDL MED RES	FILTER (hrd1*)	medium		"	"
	FILTER (hrd1s*)	medium		"	"
	FILTER (hrd2*)	medium		"	"
	FILTER (hrd2s*)	medium		"	"
	FILTER (soft*)	medium		"	"

BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	9.625	in	TOP	BOTTOM
	CASING THICKNESS	0.000	in	"	"
X-Y COMBINED CALIPER PROCESSING	X-Y Caliper	X-Axis		"	"
BIT SIZE	BIT SIZE	12.250	in	"	"
MUD DENSITY	MUD DENSITY	9.80	lbm/gal	"	"
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (slbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (zdbh*)	USE CALIPER		"	"
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	12.250	in	"	"
	FIXED DIAMETER (slbh*)	12.250	in	"	"

SL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
SL BOREHOLE	OPEN/CASED HOLE	OPEN HOLE		TOP	BOTTOM
	K COMPOUND WEIGHT %	0.00	pct	"	"
	K MUD COMPOUND TYPE	KCL		"	"
SL AUTOGAIN	AUTO GAIN (1329XA 1)	ON		"	"
SL SPECTRUM CALIBRATION	MODE	AUTOMATIC		"	"

CN PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
2446 CN MATRIX	2446 MATRIX	LIMESTONE		TOP	BOTTOM
CN SALINITY CORRECTION	SALINITY CORR (2446)	SALINITY OFF		"	"
	SALINITY	0	ppm	"	"
CN TOOL STANDOFF	ENABLE STANDOFF CORR	OFF		"	"
	STANDOFF AMOUNT	0.00	in	"	"
CN CASING & CEMENT CORRECTION	CORRECTION	OFF		"	"
	BIT SIZE BEHIND CSNG	7.875	in	"	"

ZDL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
MUD DENSITY	MUD DENSITY	9.80	lbm/gal	TOP	BOTTOM
DENSITY POROSITY	RHOMatrix	2.710	g/cm3	"	"
	RHOfluid	1.000	g/cm3	"	"
ZDL	DENX TRACKING	ON		"	"
TRACKING TIME	Logging Spd for Gain	Over 10 ft/min		"	"

CURVE DESCRIPTION REPORT

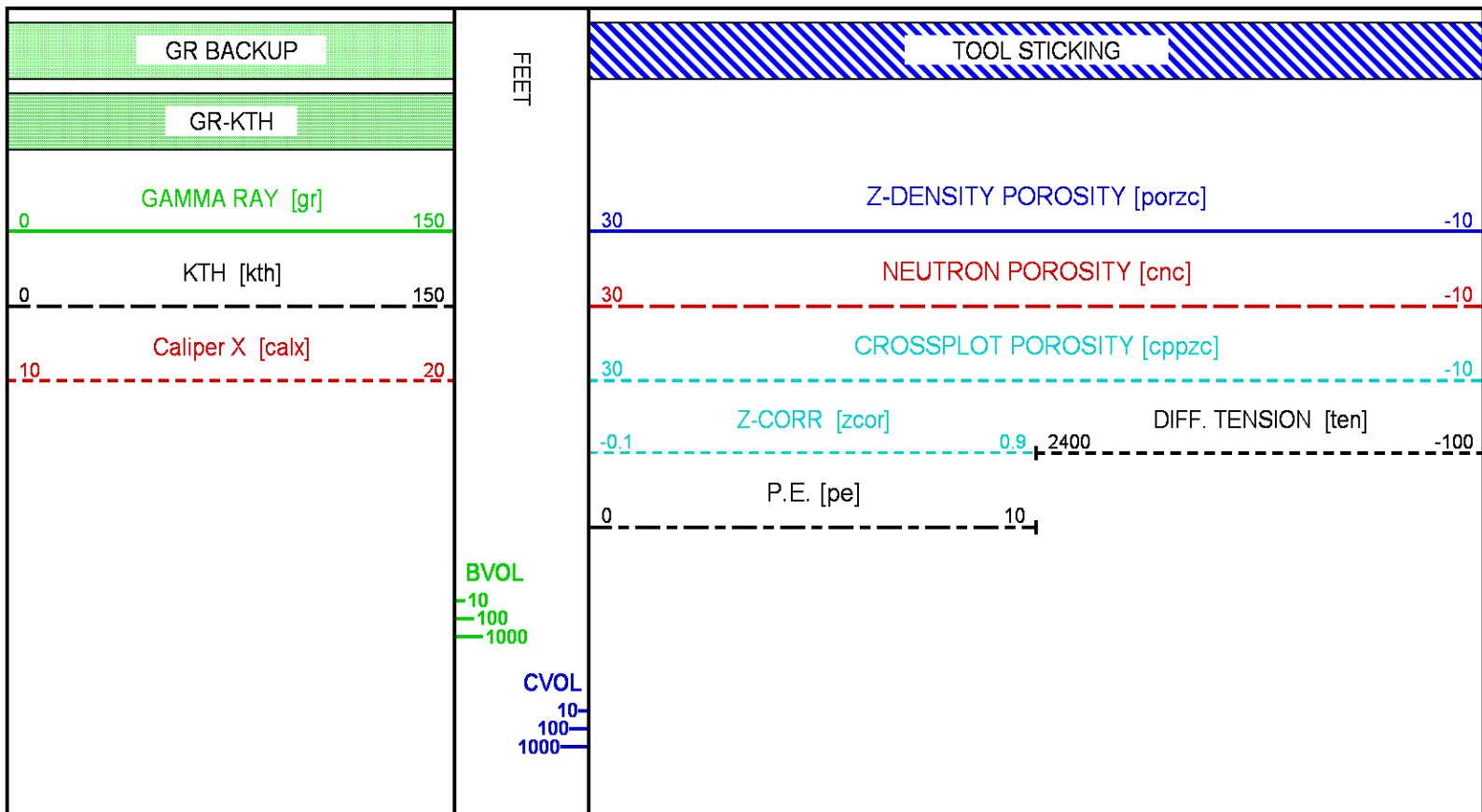
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BVOL	N/A	BOREHOLE VOLUME
F1:CALX	N/A	CALIPER FROM X-AXIS OF XY CALIPER(S)
F1:CNC	N/A	BOREHOLE SIZE CORRECTED COMPENSATED NEUTRON POROSITY
F1:CPPZC	N/A	CROSSPLOT POROSITY FROM ZDEN
F1:CVOL	N/A	CEMENT VOLUME
F1:GR	N/A	GAMMA RAY
F1:KTH	N/A	STRIPPED POTASSIUM-THORIUM
F1:PE	N/A	PHOTO ELECTRIC CROSS-SECTION
F1:PORZC	N/A	CORRECTED POROSITY
F1:TEN	N/A	DIFFERENTIAL TENSION
F1:ZCOR	N/A	DENSITY CORRECTION

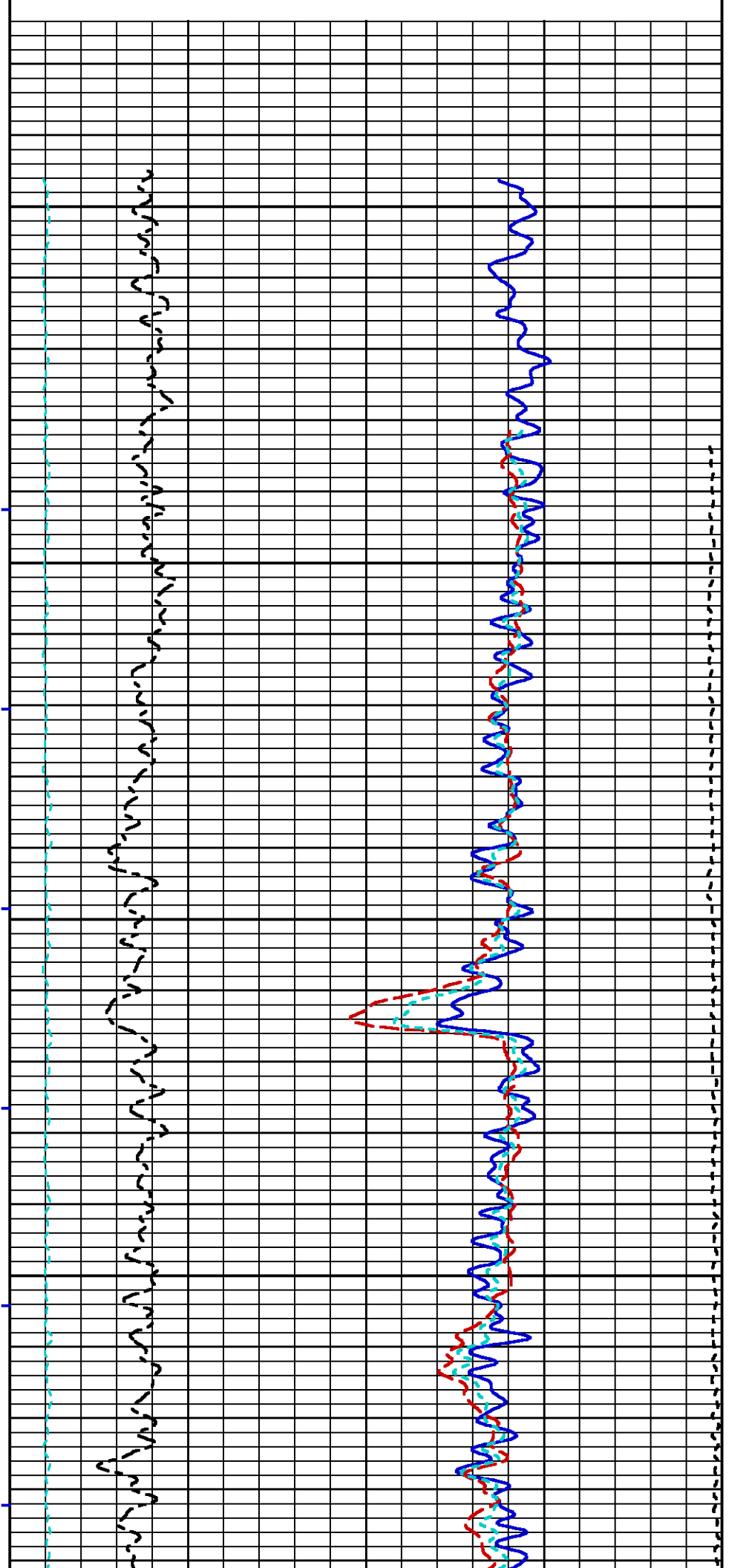
CURVE MEASURE POINT OFFSET

CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
CALX	-41.50	GR	-58.50	PORZC	-40.75		
CNC	-51.62	KTH	-58.50	TEN	0.00		
CPPZC	-40.75	PE	-40.75	ZCOR	-40.75		

Presentation : HL6690:/dat1a/md11798R3/POR_TX_5REPEAT.fvpdf [5"/100' Scale]
Plot Interval : 10075.2 - 10378.2 Feet

Data File 1 : F1 : HL6690:/dat1a/md11798R3/RR3.xtf
Created On : N/A
Company : HOLLY FRONTIER - NAVAJO
Well : NAVAJO REFINING WDW #4
Field : ARTESIA
File Interval : 10060.5 - 10379.5 Feet
OCT : p87cc



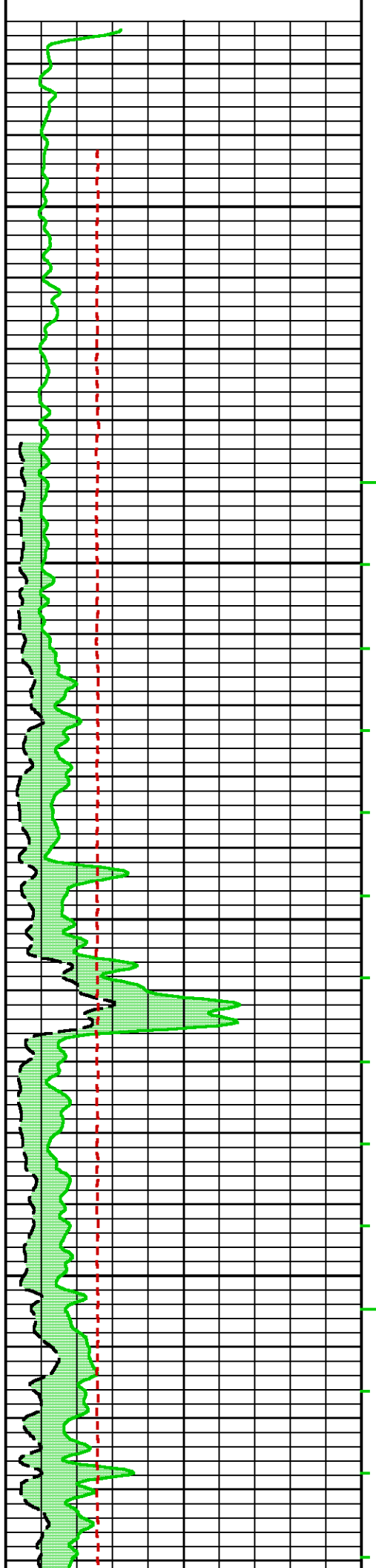


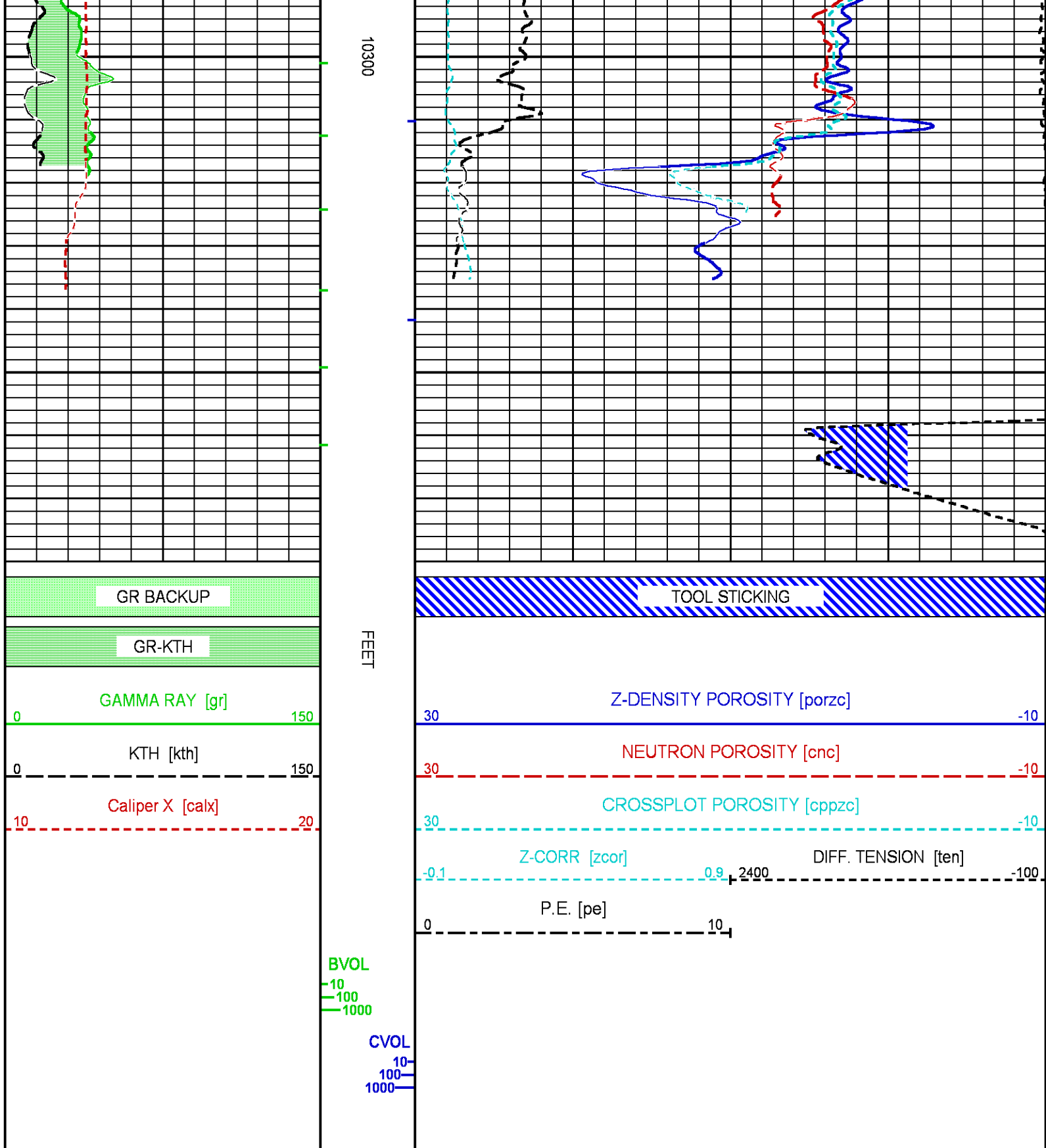
10100

10200

200

100





CALIBRATION / VERIFICATION SUMMARY

GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1329XA 179409

DATE/TIME PERFORMED: Wed May 23 12:06:32 2018

UNIT #: 3882TD HL6690

CALB JIG #: 4702NK DA-434

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	CR DIFF (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	CALBRTR (gAPI)
GR	278.98	1190.93	912.0 830.0 960.0	0.164	45.89	195.89	150

GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1329XA 179409

DATE/TIME PERFORMED: Wed May 23 12:12:49 2018

UNIT #: 3882TD HL6690

VERI JIG #: 4702NK DA-434

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	282.71	1184.62	0.164	46.50	194.85	148.35 140.00 160.00

SLSP PRIMARY CALIBRATION SUMMARY

TOOL #: 1329XA 179409

DATE/TIME PERFORMED: Wed May 23 12:09:46 2018

UNIT #: 3882TD HL6690

CALIBRATOR ID: 4702NA DA-434

	Bkgnd (cts/s)	Cal ON (cts/s)	Mult (gAPI/(cts/s))	Bkgnd (gAPI)	Cal ON (gAPI)	Cal Value (gAPI)
GR-SL (.06-3.5)	267.10	1172.45	0.166	44.25	194.25	150

	Std Rate (cts/s)	Meas Rate (cts/s)	Tool Norm	Std Mult	Log Mult	App Con (pct ppm)
E (.25-3.0)	554	581.3	0.953 0.900 1.100			
K				0.01602	0.01527	8.900
U				0.03851	0.03670	21.300
TH				0.10135	0.09659	56.100

	Mult chnl/MeV	Add chnls	QSA	QCAL	GAIN	U Pk Res %	Flask Temp (degF)
SPECTRUM	73.390	-1.978	0.030	1.000 0.980 1.020	2927	8.63	77.00

	P1 .352 MeV	P2 .609 MeV	P3 1.120 MeV	P4 1.765 MeV	P5 2.204 MeV
Std Pk	25.80	44.20	81.00	127.40	159.00
Meas Pk	23.69 22.80 28.80	42.79 40.20 48.20	80.37 76.00 86.00	127.61 121.40 133.40	159.66 152.00 166.00
Fit Pk	23.86	42.72	80.22	127.56	159.77

SLSP PRIMARY VERIFICATION SUMMARY

TOOL #: 1329XA 179409

DATE/TIME PERFORMED: Wed May 23 12:12:57 2018

UNIT #: 3882TD HL6690

CALIBRATOR ID: 4702NA DA-434

	Bkgnd (cts/s)	Cal ON (cts/s)	Mult (gAPI/(cts/s))	Bkgnd (gAPI)	Cal ON (gAPI)	Cal Value (gAPI)
GR-SL (.06-3.5)	268.38	1170.82	0.166	44.59	194.34	150 135 165

	Std rate	Meas rate	Tool norm	Std Mult	Log Mult	App Con (pct ppm)
E (.25-3.0)	554	580.7	0.953			
K				0.01602	0.01527	8.866 8.010 9.790
U				0.03851	0.03670	21.313 19.170 23.430
TH				0.10135	0.09659	56.092 50.490 61.710

	Mult chnl/MeV	Add chnls	QSA	QCAL	GAIN	U Pk Res %	Flask Temp (degF)
SPECTRUM	73.601	-1.948	0.163	1.003 0.980 1.020	2927	8.80	77.86

	P1 .352 MeV	P2 .609 MeV	P3 1.120 MeV	P4 1.765 MeV	P5 2.204 MeV
Std Pk	25.80	44.20	81.00	127.40	159.00
Meas Pk	23.72 22.80 28.80	42.89 40.20 48.20	80.73 76.00 86.00	128.33 121.40 133.40	159.89 152.00 166.00
Fit Pk	23.96	42.88	80.49	127.96	160.27

CN PRIMARY CALIBRATION SUMMARY

TOOL #: 2446XA 154181

DATE/TIME PERFORMED: Wed May 23 13:36:05 2018

UNIT #: 3882TD HL6690

CALIBRATOR #: 2437XB 113988

SOURCE #: 4717XS SN-919

	MEASURED	DEADTM CORR	DTC	NOMINAL	CORRECTION	POROSITY
	CPS	CPS	SSN/LSN	SSN/LSN	FACTOR	(pu)
LSN	627.71	637.31				
SSN	1644.53	1700.46				
RATIO			2.66817	2.75100	1.03104	
					0.97000 1.07000	
CN						21.358

CN PRIMARY VERIFICATION SUMMARY

TOOL #: 2446XA 154181 DATE/TIME PERFORMED: Wed May 23 13:45:25 2018

UNIT #: 3882TD HL6690 ICE BLOCK #: 4717ND VD-164

	MEASURED	DEADTM CORR	DTC	CORRECTION	DTC CORR	POROSITY
	CPS	CPS	SSN/LSN	FACTOR	SSN/LSN	(pu)
LSN	1873.37	1961.61				
SSN	4095.73	4461.25				
RATIO			2.27428	1.03104	2.34627	
CN						15.822

CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 2234XA 10495292 DATE/TIME PERFORMED: Wed May 23 10:56:44 2018

UNIT #: 3882TD HL6690

	SMALL RING	LARGE RING	MULT	ADD	SMALL RING	LARGE RING
					(in)	(in)
CALIPER	925.2	1411.6	0.00874	-0.20909	7.875	12.125

CAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2234XA 10495292 DATE/TIME PERFORMED: Fri Jun 29 01:51:38 2018 DAYS SINCE CAL: 36

UNIT #: 3882TD HL6690

	I.D.	MULT	ADD	I.D.
				(in)
CALIPER	1450.0	0.00874	-0.05461	12.615

ZDL PRIMARY CALIBRATION SUMMARY

TOOL: 2234XA 10495292

DATE/TIME PERFORMED: Wed May 23 11:38:39 2018

UNIT: 3882TD HL6690

CALB BLKS: 2225XA 114927

CS SRC: 4703NT 10207B

	SS CS PK (Channel)	LS CS PK (Channel)	SS_BKGD (cps)	LS BKGD (cps)		
	225.3 220.0 230.0	224.4 220.0 230.0	1257.3	1385.8		
	SS (cps)	LS (cps)	SHR	DEN (g/cm3)	CORR (g/cm3)	PE (b/e)
MG (LO PE)	18603.1	9180.2	0.639 0.585 0.685	1.703	0.002	2.180
AL	10726.9	923.5		2.697	-0.008	
AL + SHIM	14849.8	1613.9		2.617	0.159	
MG + SHIM (HI PE)	9118.2	4435.9	0.257 0.210 0.270			8.600
RATIO AL + SHIM/AL	1.38 1.32 1.42	1.75 1.64 1.84				
RATIO MG/AL	1.73 1.65 1.78	9.94 9.40 10.20				

**BAKER
HUGHES**
a GE company



COMPANY
WELL
FIELD
COUNTY

HOLLY FRONTIER - NAVAJO
NAVAJO REFINING WDW #4
ARTESIA
EDDY **STATE NEW MEXICO**

FILE NO:

MD11798

API NO:

30-015-44677

LOCATION:

1217' FSL & 2443' FWL
SECTION 23, T17S, R27E
N.M.P.M. SURVEY

ELEVATIONS:

KB 3585.8 FT
DF 3584.8 FT
GL 3565.8 FT

DATE

16-JUN-2018

MAIN LOG 1"/100FT SCALE

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017
Updates: 32 Patches: 4

Plotted: Fri Jun 29 10:51:00 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /data/mid11798/R3/p87/c03.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 9691.591 ft BOTTOM DEPTH: 9691.591 ft

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
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TENSION	FILTER ()	medium (1)	TOP	BOTTOM
GR	FILTER ()	medium (1)	"	"
CN	FILTER ()	medium (1)	"	"
CALIPER	FILTER ()	medium (1)	"	"
ZDL MED RES	FILTER (hid1*)	medium	"	"
	FILTER (hid1a*)	medium	"	"
	FILTER (hid2*)	medium	"	"
	FILTER (hid2a*)	medium	"	"

BOREHOLE & CEMENT					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	9.625	in	TOP	BOTTOM
	CASING THICKNESS	0.000	in	"	"
X-Y COMBINED CALIPER PROCESSING	X-Y Caliper	X-Axis	"	"	"
	BIT SIZE	12.250	in	"	"
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER	"	"	"
	CALIPER/FIXED DIA. (zdbh*)	USE CALIPER	"	"	"
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	12.250	in	"	"

CN PROCESSING					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
2-4# CN MATRIX	2-4# MATRIX	LIMESTONE	"	TOP	BOTTOM
	CN SALINITY CORRECTION	SALINITY CORR (2-4#)	"	"	"
CN TOOL STANDOFF	SALINITY	0	ppm	"	"
	ENABLE STANDOFF CORR	OFF	"	"	"
CN CASING & CEMENT CORRECTION	STANDOFF AMOUNT	0.00	in	"	"
	CORRECTION	OFF	"	"	"
	BIT SIZE BEHIND CSNG	7.875	in	"	"

ZDL PROCESSING					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
MUD DENSITY	MUD DENSITY	9.80	lbm/gal	TOP	BOTTOM
ZDL	DENX TRACKING	ON	"	"	"
TRACKING TIME	Logging Spd for Gain	Over 10 ft/min	"	"	"

CURVE DESCRIPTION REPORT		
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BVOL	N/A	BOREHOLE VOLUME
F1:CALX	N/A	CALIPER FROM X-AXIS OF XY CALIPER(S)
F1:CNC	N/A	BOREHOLE SIZE CORRECTED COMPENSATED NEUTRON POROSITY
F1:CVOL	N/A	CEMENT VOLUME
F1:GR	N/A	GAMMA RAY
F1:TEN	N/A	DIFFERENTIAL TENSION
F1:ZCOR	N/A	DENSITY CORRECTION
F1:ZDNC	N/A	BOREHOLE SIZE/MUD WEIGHT CORRECTED DENSITY

CURVE MEASURE POINT OFFSET							
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
CALX	-49.00	GR	-66.25	ZCOR	-48.25		
CNC	-59.25	TEN	0.00	ZDNC	-48.25		

Presentation	: HL6690:/data/md11798R3/POR_TX_1.fvpdf [2"/100' Scale]
Plot Interval	: 1573 - 10372 Feet
Data File 1	: F1 : HL6690:/data/md11798R3/R2.xtf
Created On	: N/A
Company	: HOLLY FRONTIER - NAVAJO
Well	: NAVAJO REFINING WDW #4
Field	: ARTESIA
File Interval	: 1558.5 - 10373.2 Feet
OCT	: p87cc

