

FILE NO: US624381	COMPANY FIRST LIBERTY ENERGY INC
API NO: 05105060190000	WELL BASIN #1 FIELD DEL NORTE COUNTY RIO GRANDE
Ver. 3.87 D&J RIG #1	LOCATION: NESE 59; T40N; RSE 1900' FSL 660 FEL LAT: 37.726122 LON: -106.425207 SEC 9 TWP 40N RGE SE
PERMANENT DATUM LOG MEASURED FROM DRILL MEAS. FROM	OTHER SERVICES BOND LOG ELEVATIONS: GL 8176 FT KB 8193.5 FT DF GL 8176 FT

DATE	07-MAR-2013		21-MAR-2013	
RUN	TRIP	2	1	3
SERVICE ORDER		624379		624381
DEPTH DRILLER		4812 FT		9270 FT
DEPTH LOGGER		4805 FT		9234 FT
BOTTOM LOGGED INTERVAL		4802 FT		9220 FT
TOP LOGGED INTERVAL		1200 FT		4780 FT
CASING DRILLER		9.625 IN		7 IN
CASING LOGGER		1208 FT		4788 FT
BIT SIZE		8.75 IN		6.125 IN
TYPE OF FLUID IN HOLE		WBM		WBM
DENSITY	VISCOSITY	8.9 LB/G	45 S	8.8 LB/G
PH	FLUID LOSS	9.0	8.8 C3	10
SOURCE OF SAMPLE		FLOWLINE		FLOWLINE
RM AT MEAS. TEMP.		2.35 OHMM	57 DEGF	2.8 OHMM
RMF AT MEAS. TEMP.		1.76 OHMM	52 DEGF	2.1 OHMM
RMC AT MEAS. TEMP.		2.93 OHMM	52 DEGF	3.5 OHMM
SOURCE OF RMF	RMC	CALCULATED	CALCULATED	CALCULATED
RM AT BHT		0.332 OHMM	140 DEGF	0.983 OHMM
TIME SINCE CIRCULATION		8		7
MAX. RECORDED TEMP.		145 DEGF		224 DEGF
EQUIP. NO.	LOCATION	6685	GRAND JUNCT	6685
RECORDED BY		SMITH/PATTON		PATTON/SMITH
WITNESSED BY		S. OSBORN/R. SAY		S. OSBORN/R. SAY

DATE	02-MAR-2013		21-MAR-2013	
RUN	TRIP	1	1	4
SERVICE ORDER		US624377		
DEPTH DRILLER		1243 FT		
DEPTH LOGGER		1240 FT		
BOTTOM LOGGED INTERVAL		1237 FT		
TOP LOGGED INTERVAL		30 FT		
CASING DRILLER		16 IN		
CASING LOGGER		74 FT		
BIT SIZE		12.25 IN		
TYPE OF FLUID IN HOLE		WBM		
DENSITY	VISCOSITY	9.9 LB/G	48 S	
PH	FLUID LOSS	9.9	12 C3	
SOURCE OF SAMPLE		FLOWLINE		
RM AT MEAS. TEMP.		3.3 OHMM	55 DEGF	
RMF AT MEAS. TEMP.		2.48 OHMM	50 DEGF	
RMC AT MEAS. TEMP.		4.3 OHMM	50 DEGF	
SOURCE OF RMF	RMC	CALCULATED	CALCULATED	
RM AT BHT		2.065 OHMM	79 DEGF	
TIME SINCE CIRCULATION		6		
MAX. RECORDED TEMP.		79 DEGF		
EQUIP. NO.	LOCATION	6685	GRAND JUNCT	
RECORDED BY		SMITH/PATTON		
WITNESSED BY		S.OSBORN/R.SAY		

DATE	21-MAR-2013		21-MAR-2013	
RUN	TRIP	5	1	6
SERVICE ORDER				
DEPTH DRILLER				
DEPTH LOGGER				
BOTTOM LOGGED INTERVAL				
TOP LOGGED INTERVAL				
CASING DRILLER				
CASING LOGGER				
BIT SIZE				
TYPE OF FLUID IN HOLE				
DENSITY	VISCOSITY			
PH	FLUID LOSS			
SOURCE OF SAMPLE				
RM AT MEAS. TEMP.				
RMF AT MEAS. TEMP.				
RMC AT MEAS. TEMP.				
SOURCE OF RMF	RMC			
RM AT BHT				
TIME SINCE CIRCULATION				
MAX. RECORDED TEMP.				
EQUIP. NO.	LOCATION			
RECORDED BY				
WITNESSED BY				



RUN 1 TRIP 1 :  
 RUN 4 TRIP 1 :  
 RUN 5 TRIP 1 :  
 RUN 6 TRIP 1 :

EQUIPMENT DATA					
RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
0	0				
1	1	COMMON REMO	3514XB	10240730	FREE
1	1	GAMMA/ SL	1329XA	10203001	FREE
1	1	CN	2446XA	10202034	DECENTRALIZED
1	1	ZDL	2234XA	10211833	PAD DEVICE
1	1	KNUCKLE	3939XA	10185406	FREE
1	1	HDIL ELEC	1515EA	10318637	FREE
1	1	HDIL MANDRL	1515MA	10417303	FREE
1	1	SWIVEL	3944XD	10138308	FREE
1	1	TIRM	3981XA	10516527	FREE
2	1	TTMA	3980XA	10142233	FREE
2	1	TELE/GR	3518EG/EB	10411092	FREE
2	1	CN	2436XA	10137930	DECENTRALIZED
2	1	ZDL	2223XA	10102922	PAD DEVICE
2	1	DBL KNCKL	3930XA	10139400	FREE
2	1	HDIL	1530XA	10103013	FREE
3	1	TTMA	3514XA	10120299	FREE
3	1	GR	1329XA	10139870	FREE
3	1	CN	2446XA	10137930	DECENTRALIZED
3	1	ZDL	2223XA	101391895	PAD DEVICE
3	1	HDIL	1515MA	10103013	STOOD OFF

## MAIN LOG 5"/100FT SCALE

ECLIPS 6.1i Aug 06, 2010  
 Updates: 1,2 Patches: 2

Thu Mar 21 12:48:17 2013

Pcrplt /main/62

Cplot

Pdf\_Cpp /main/16

Fileview 5.61

### PARAMETER AND FILTER SUMMARY REPORT

File: /data/624379/m970a02.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 991.000 ft BOTTOM DEPTH: 4821.945 ft

### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
GR MED RES	FILTER ()	medium (1)		TOP	BOTTOM
CALIPER	FILTER ()	medium (1)		"	"
TENSION	FILTER ()	medium (1)		"	"
CN MED RES	FILTER ()	medium (1)		"	"
ZDL MED RES	FILTER (hrd1*)	medium		"	"
	FILTER (hrd1s*)	medium		"	"
	FILTER (hrd2*)	medium		"	"
	FILTER (hrd2s*)	medium		"	"
	FILTER (soft*)	medium		"	"
SP-SPDH	FILTER ()	heavy (3)		"	"

### BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	7.000	ln	TOP	BOTTOM
	CASING THICKNESS	0.000	ln	"	"
BIT SIZE	BIT SIZE	8.750	ln	"	"

BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER			
	CALIPER/FIXED DIA. (mbh*)	USE CALIPER			
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	8.750	ln		
	FIXED DIAMETER (mbh*)	8.750	ln		
MUD SAMPLE RESISTIVITY	MUD SAMPLE TEMP	57.0	degF		
	MUD SAMPLE RES	2.350	ohm.m		
BH MUD RESISTIVITY SOURCE	RMUD SOURCE (HDIL)	TOOL MEASURED			
BOREHOLE TEMP from GRADIENT	Known BH REF TEMP	77.0	degF		
	at BH REF DEPTH	0.0	ft		
	with TEMP GRADIENT	1.200	0.01 degF/ft		

### ACCELERATION PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
ACCEL CORR SWITCH	ACCEL DEPTH CORR	CORRECTION ON		TOP	BOTTOM

### CN PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CN MATRIX	2436 MATRIX	SANDSTONE		TOP	BOTTOM
CN BOREHOLE CORRECTION	SALINITY	500	ppm		
	BOREHOLE CORRECTION	ON			
CN CASING & CEMENT CORRECTION	CORRECTION	OFF			
	BIT SIZE BEHIND CSNG	12.500	ln		

### ZDL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
DENSITY POROSITY	Air Filled Borehole	NO		TOP	BOTTOM
	RHOmatrix	2.680	g/cm3		
	RHOfluid	1.000	g/cm3		

### HDIL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
HDIL TEMPERATURE CORRECTION	TEMP CORRECTION	ON		TOP	BOTTOM
ADAPTIVE BOREHOLE CORRECTION	ABC PROCESSING	ON			
	ABC to CALCULATE	MUD CONDUCTIVITY			
	STANDOFF	1.50	ln		
	TOOL POSITION	ECCENTERED			
	Rmud MULTIPLIER	1.000			

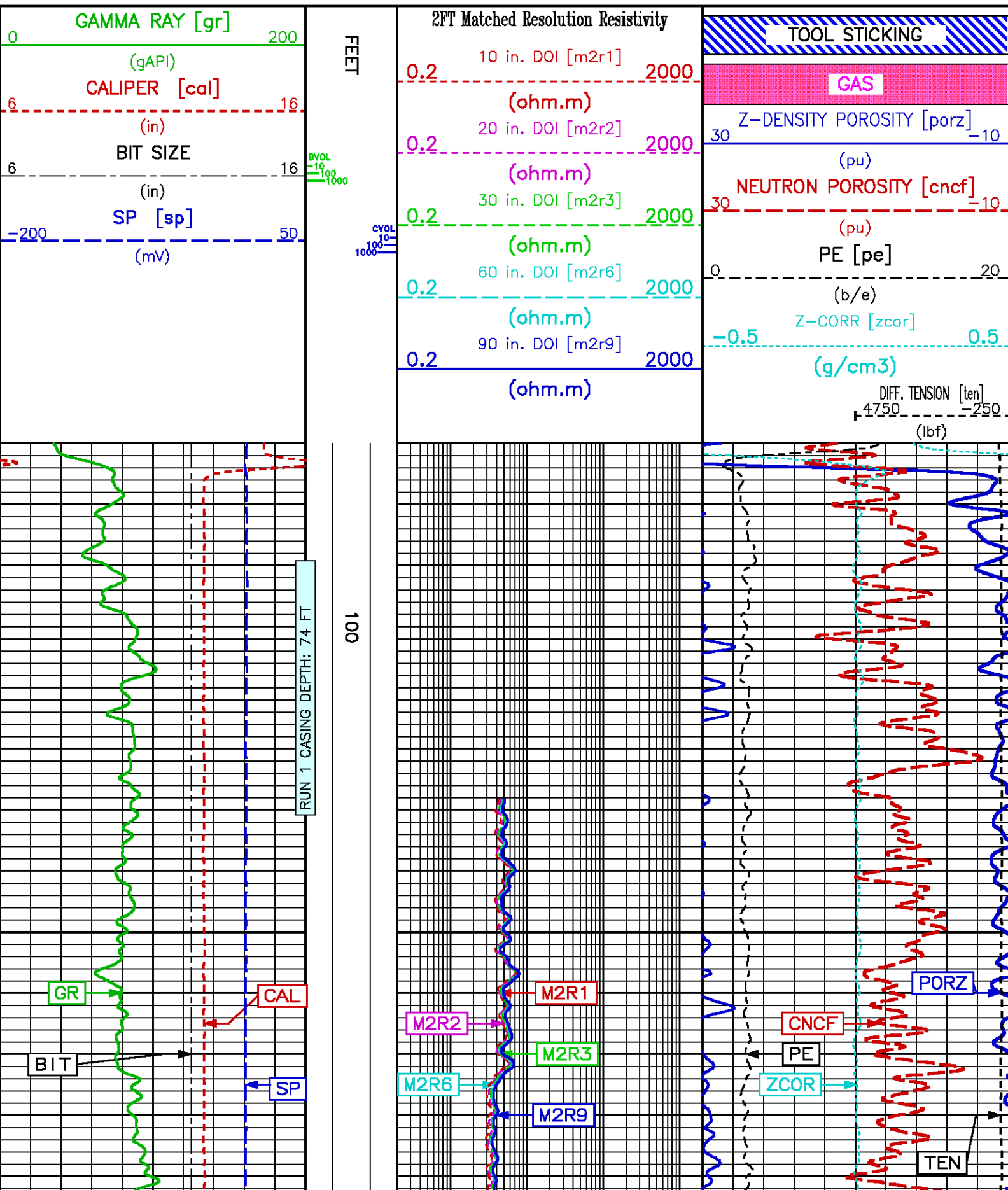
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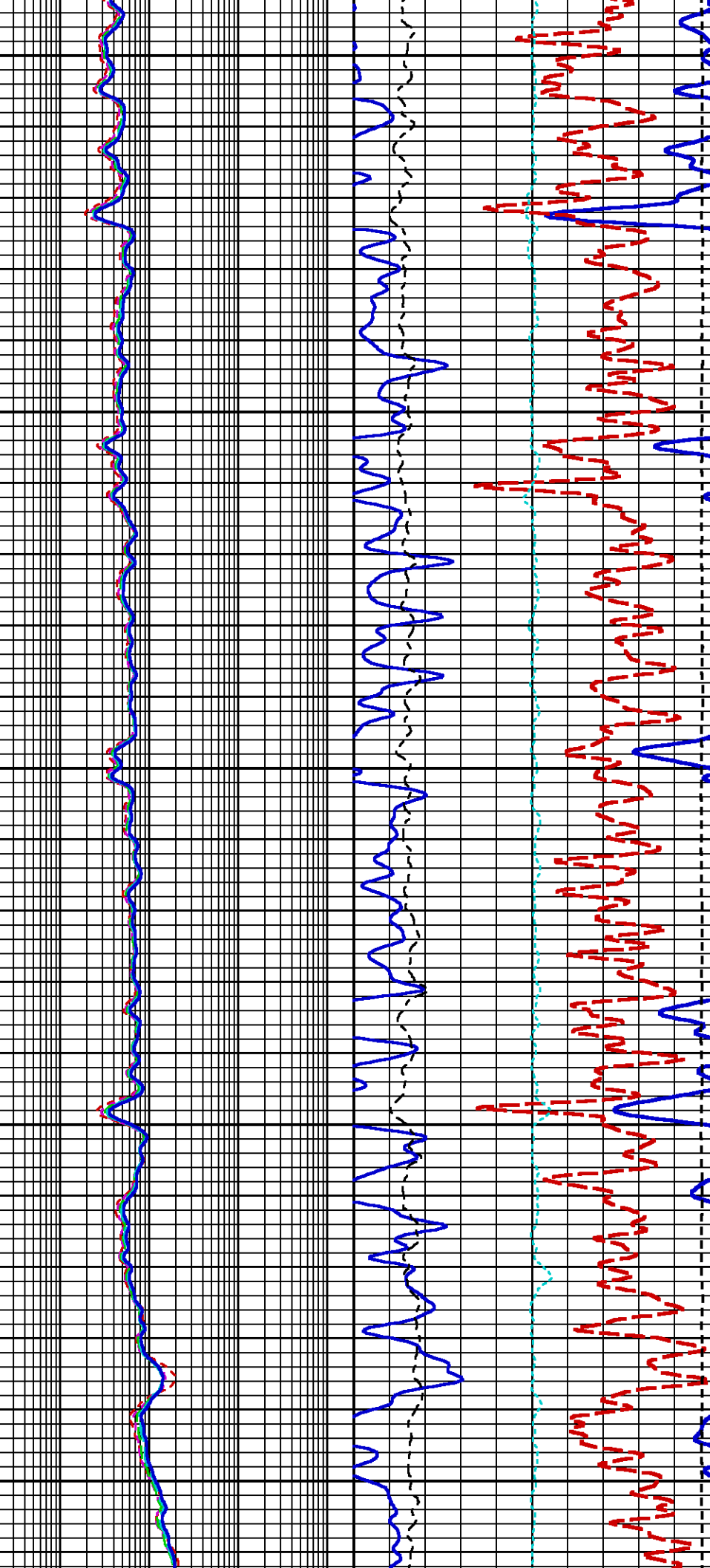
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
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F1:BVOL	Mar 7 15:51:59 2013	BOREHOLE VOLUME
F1:CAL	Mar 7 15:51:59 2013	CALIPER
F1:CNCF	Mar 7 15:51:59 2013	FIELD NORMALIZED COMPENSATED NEUTRON POROSITY
F1:CVOL	Mar 7 15:51:59 2013	CEMENT VOLUME
F1:GR	Mar 7 15:51:59 2013	GAMMA RAY
F1:M2R1	Mar 7 15:51:59 2013	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 10-INCH DOI
F1:M2R2	Mar 7 15:51:59 2013	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 20-INCH DOI
F1:M2R3	Mar 7 15:51:59 2013	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 30-INCH DOI
F1:M2R6	Mar 7 15:51:59 2013	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 60-INCH DOI
F1:M2R9	Mar 7 15:51:59 2013	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 90-INCH DOI
F1:PE	Mar 7 15:51:59 2013	PHOTO ELECTRIC CROSS-SECTION
F1:PORZ	Mar 7 15:51:59 2013	POROSITY FOR SELECTABLE MATRIX
F1:SP	Mar 7 15:51:59 2013	SPONTANEOUS POTENTIAL
F1:TEN	Mar 7 15:51:59 2013	DIFFERENTIAL TENSION
F1:ZCOR	Mar 7 15:51:59 2013	DENSITY CORRECTION

### CURVE MEASURE POINT OFFSET

CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
BIT	0.00	M2R1	2.75	M2R9	2.75	TEN	0.00
CAL	18.12	M2R2	2.75	PE	18.00	ZCOR	18.00
CNCF	27.38	M2R3	2.75	PORZ	18.00		
GR	35.00	M2R6	2.75	SP	1.25		

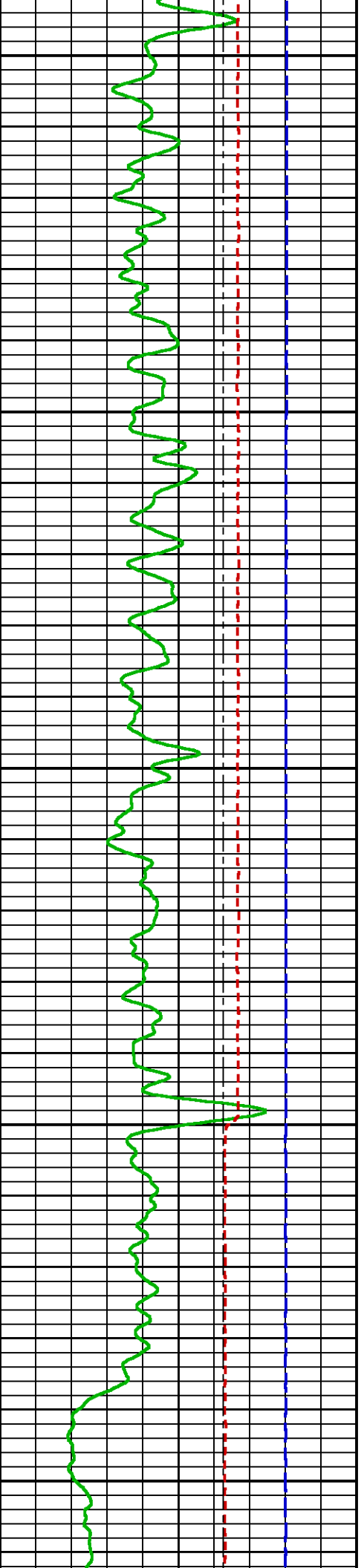
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Created On : Mar 7 15:51:59 2013  
Company : FIRST LIBERTY ENERGY INC  
Well : BASIN #1  
Field : WILDCAT  
File Interval : 70 - 9250 Feet  
Oct : m970a

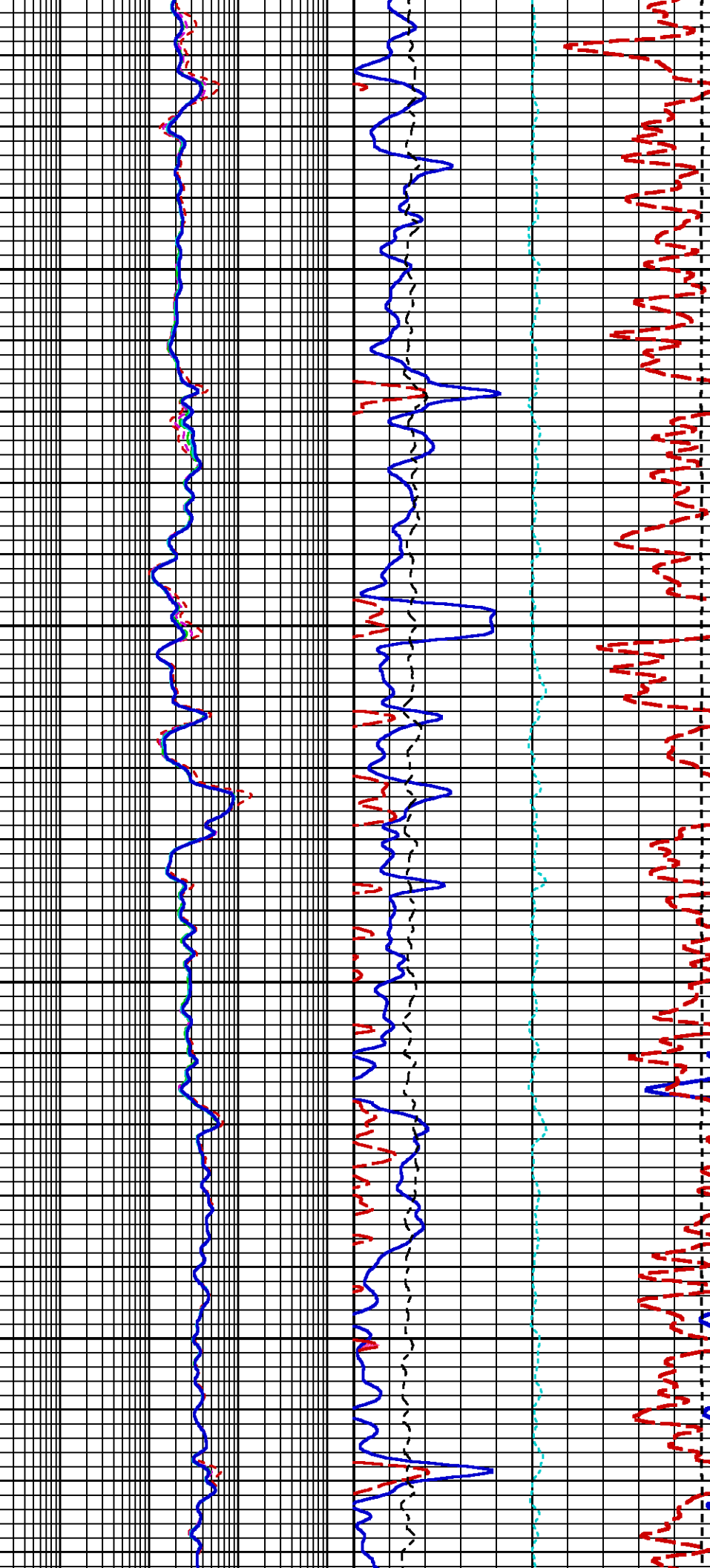




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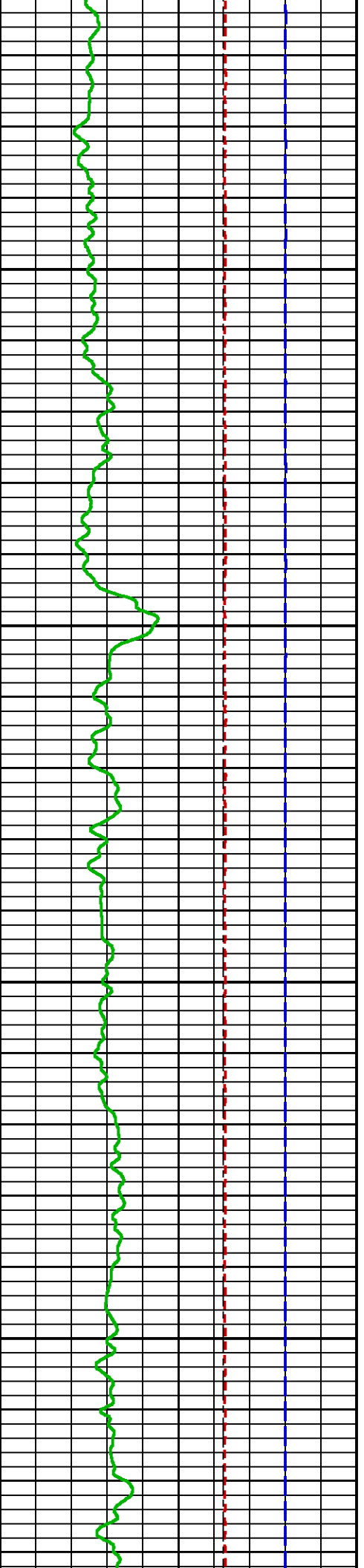
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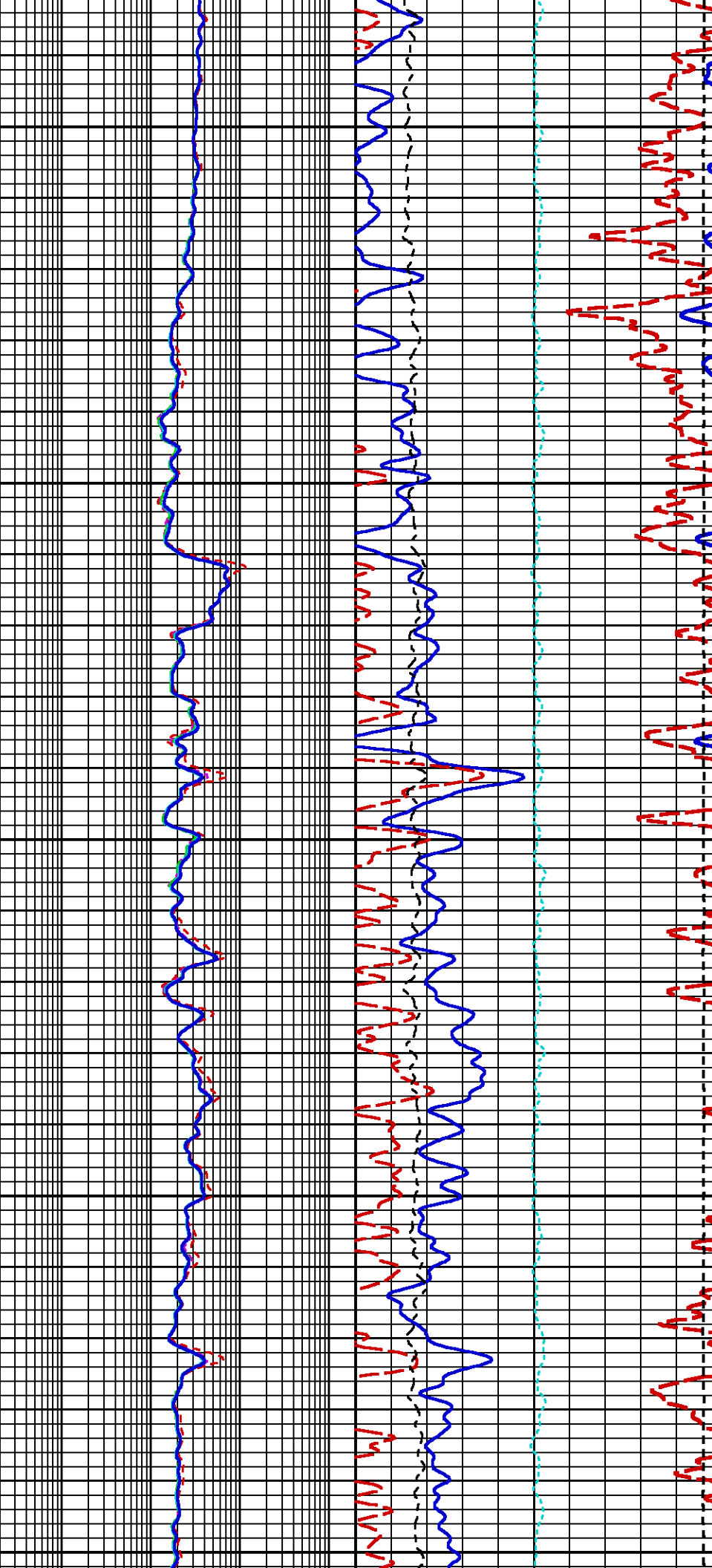




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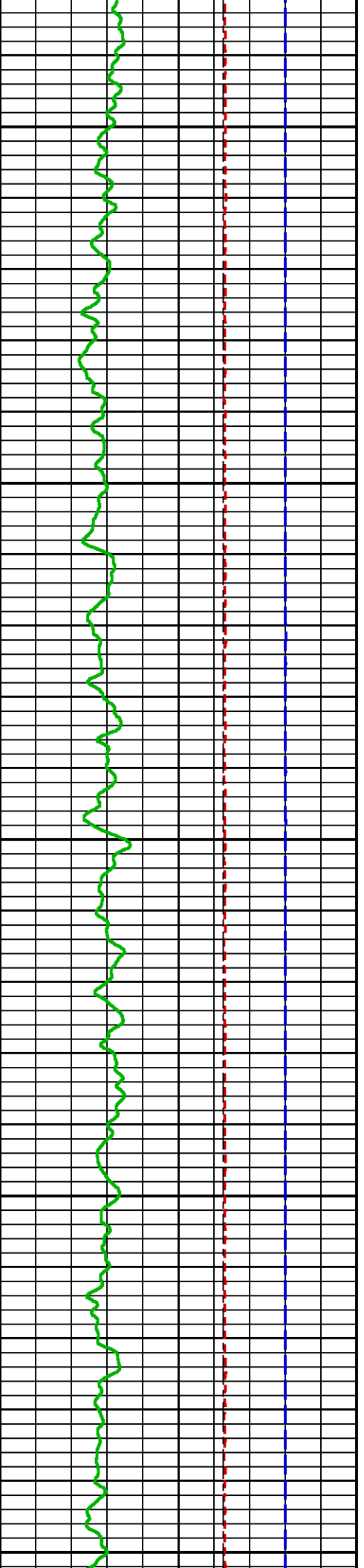
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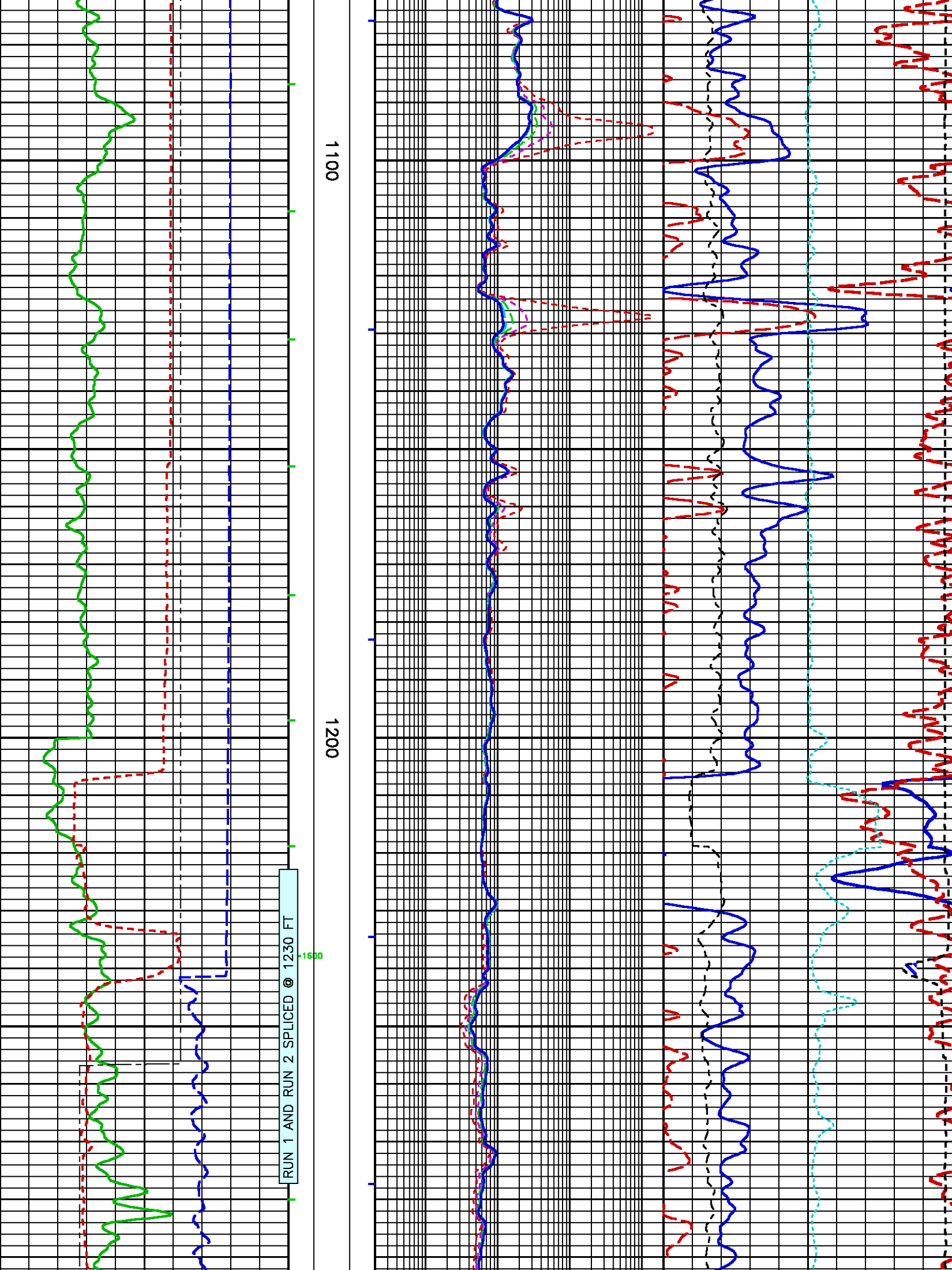
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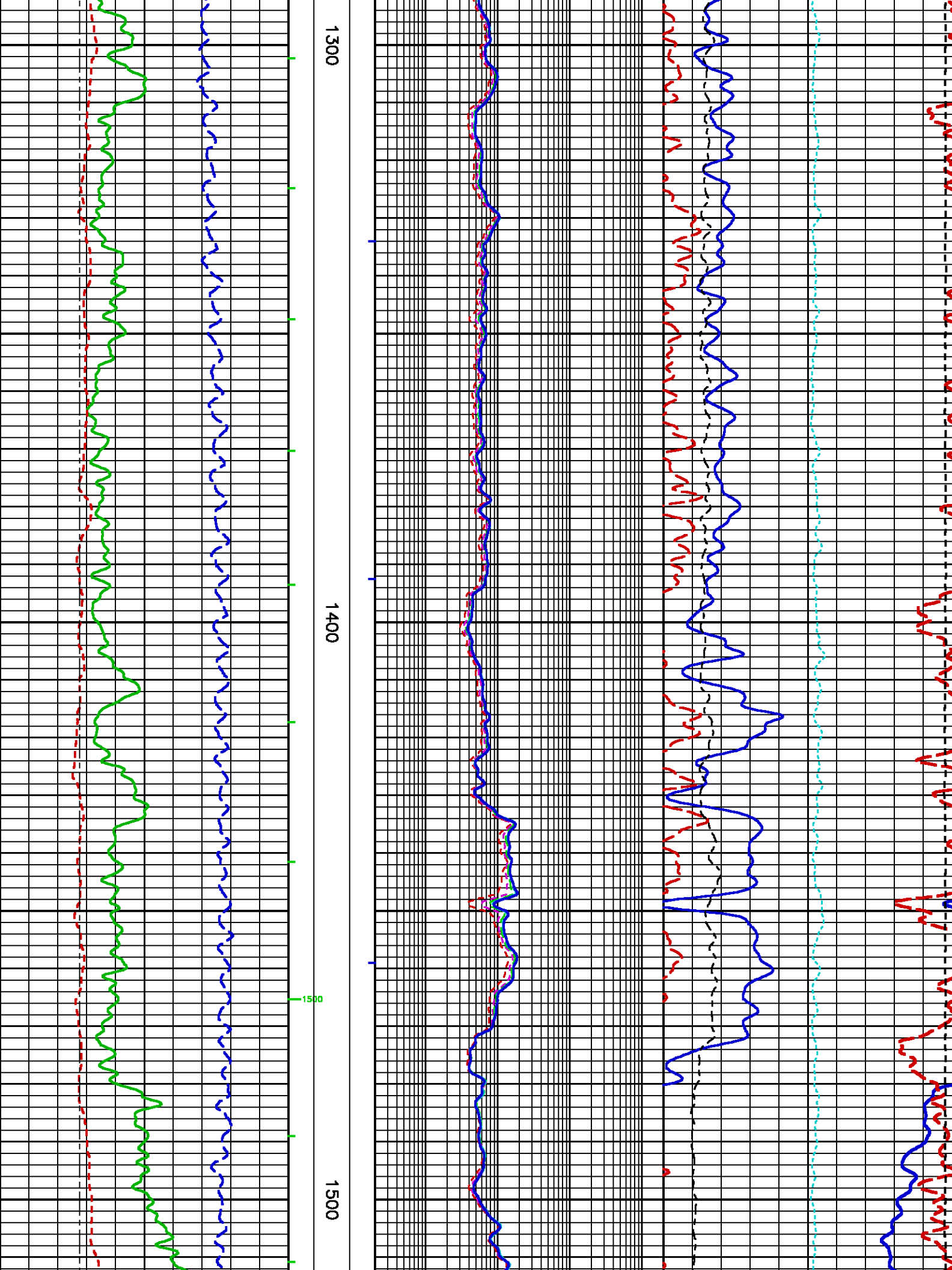
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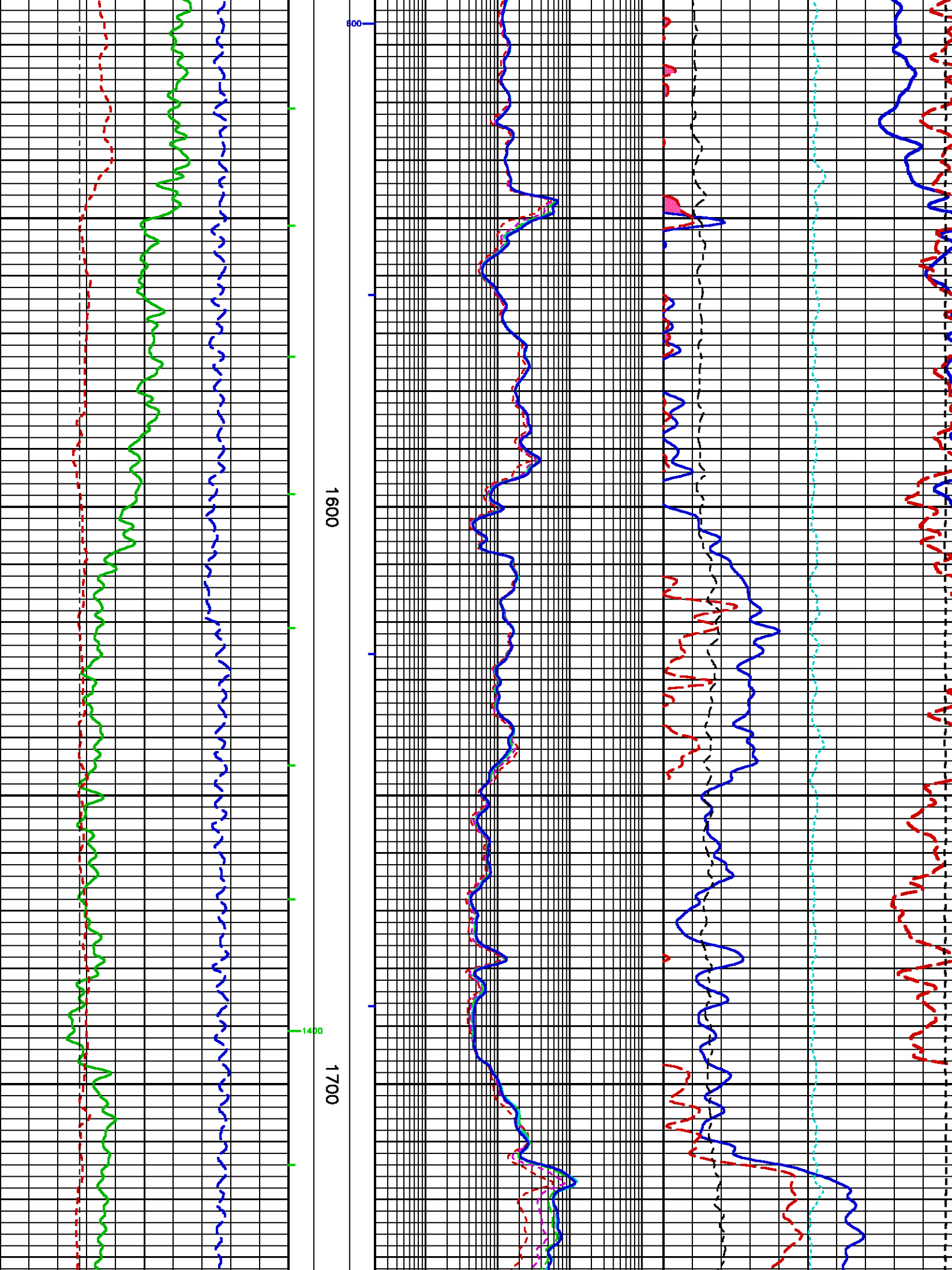




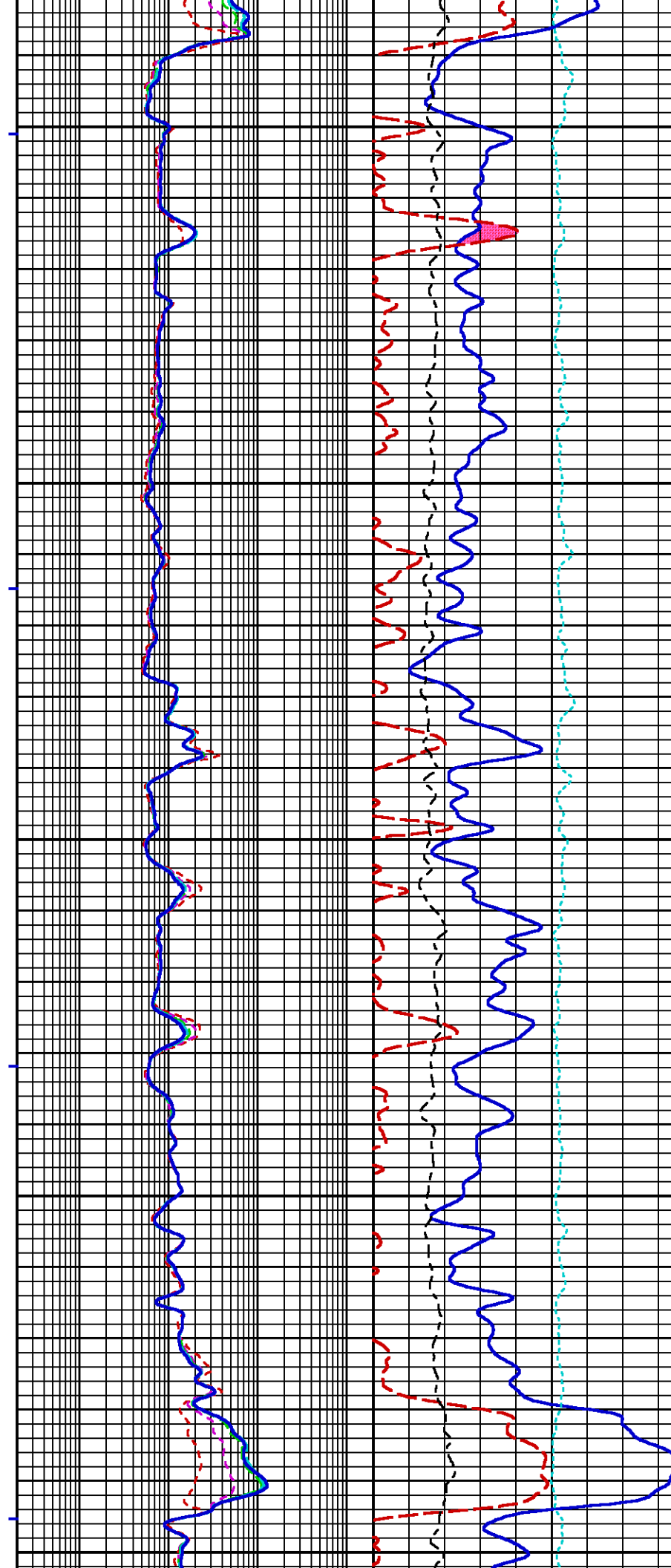








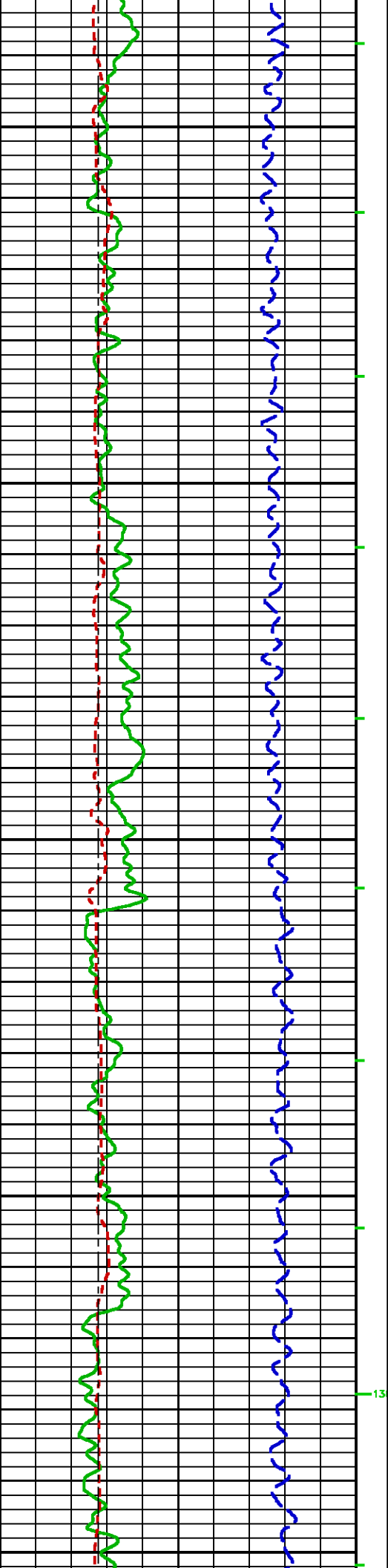
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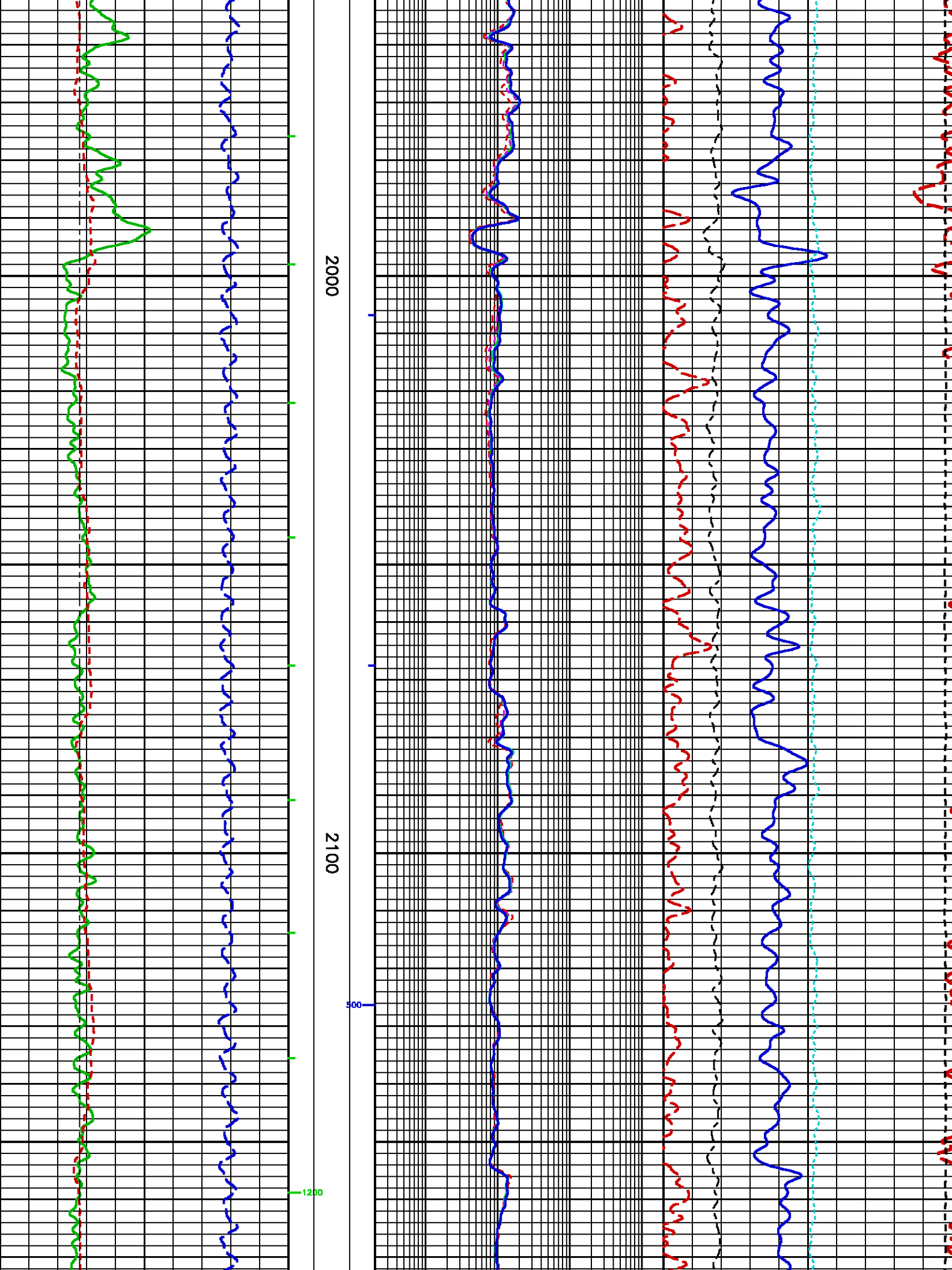


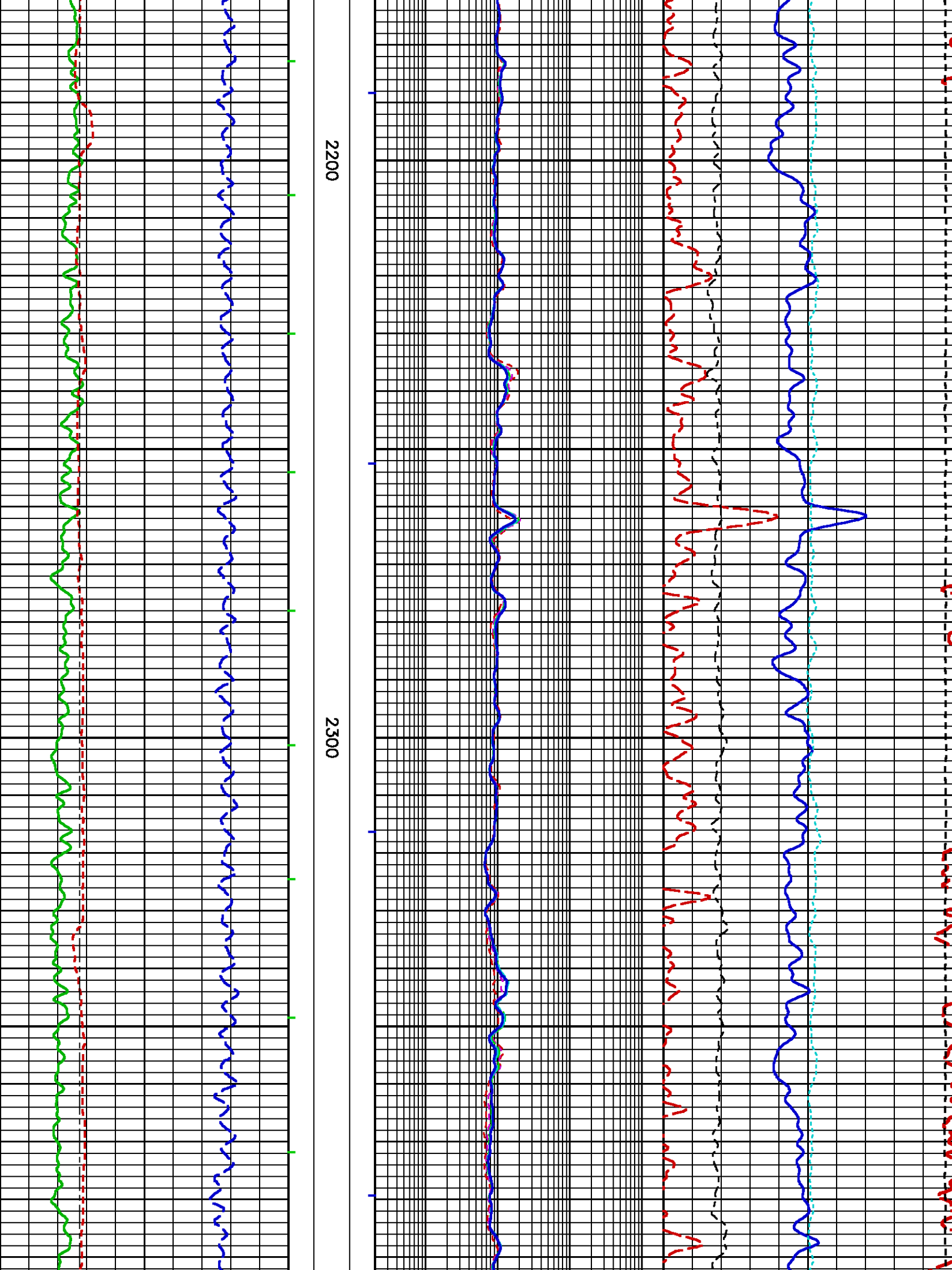
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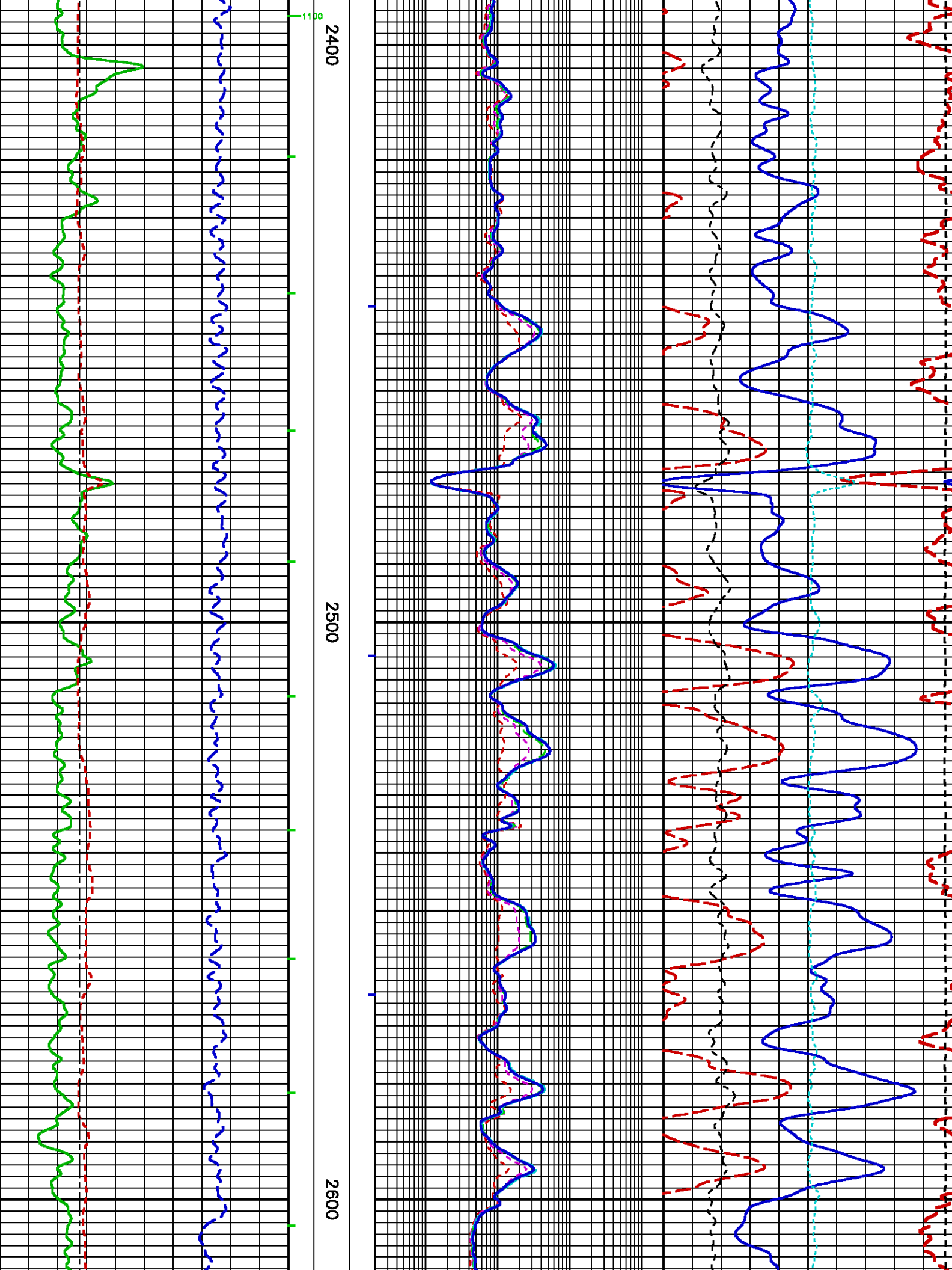
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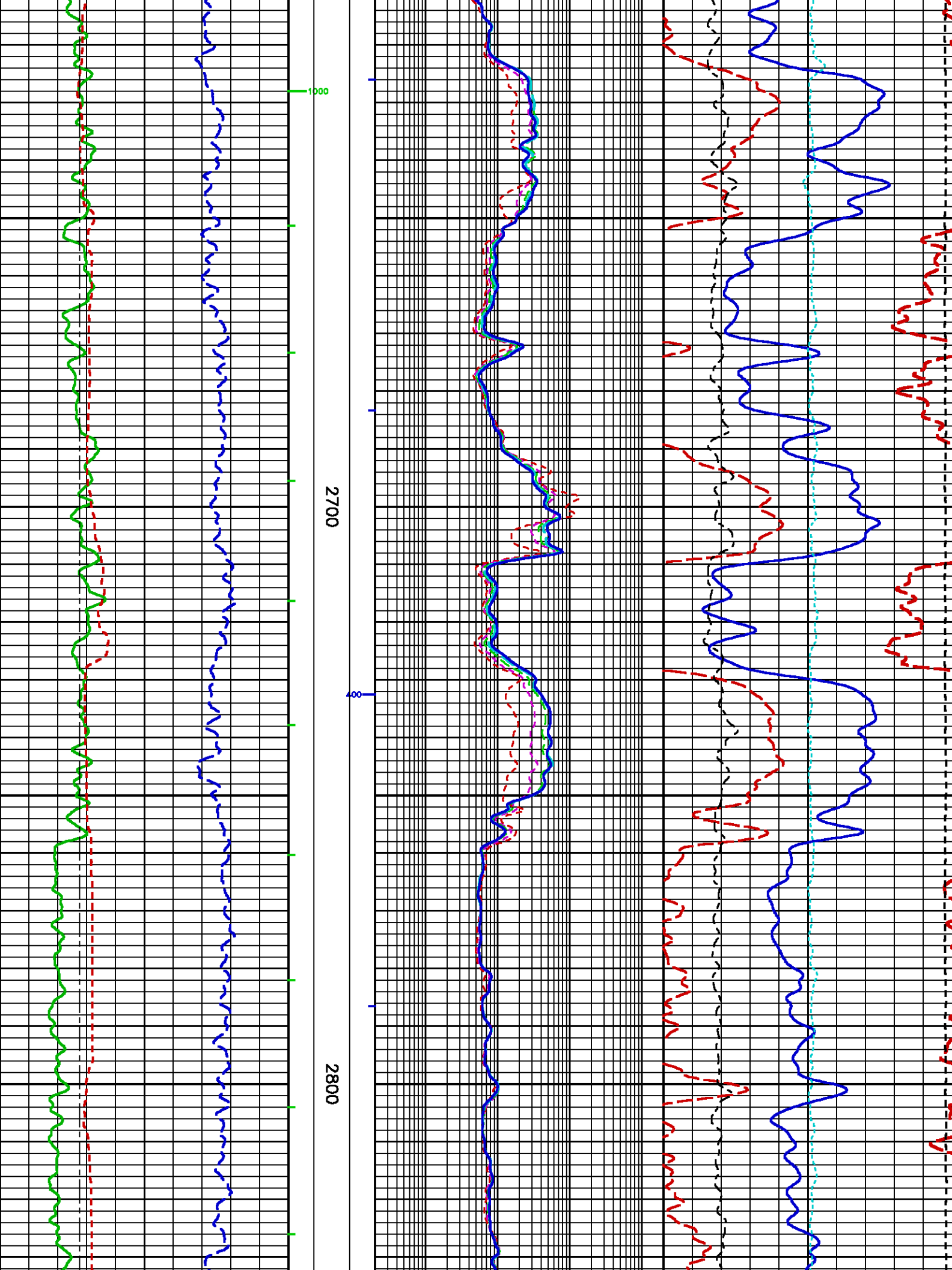


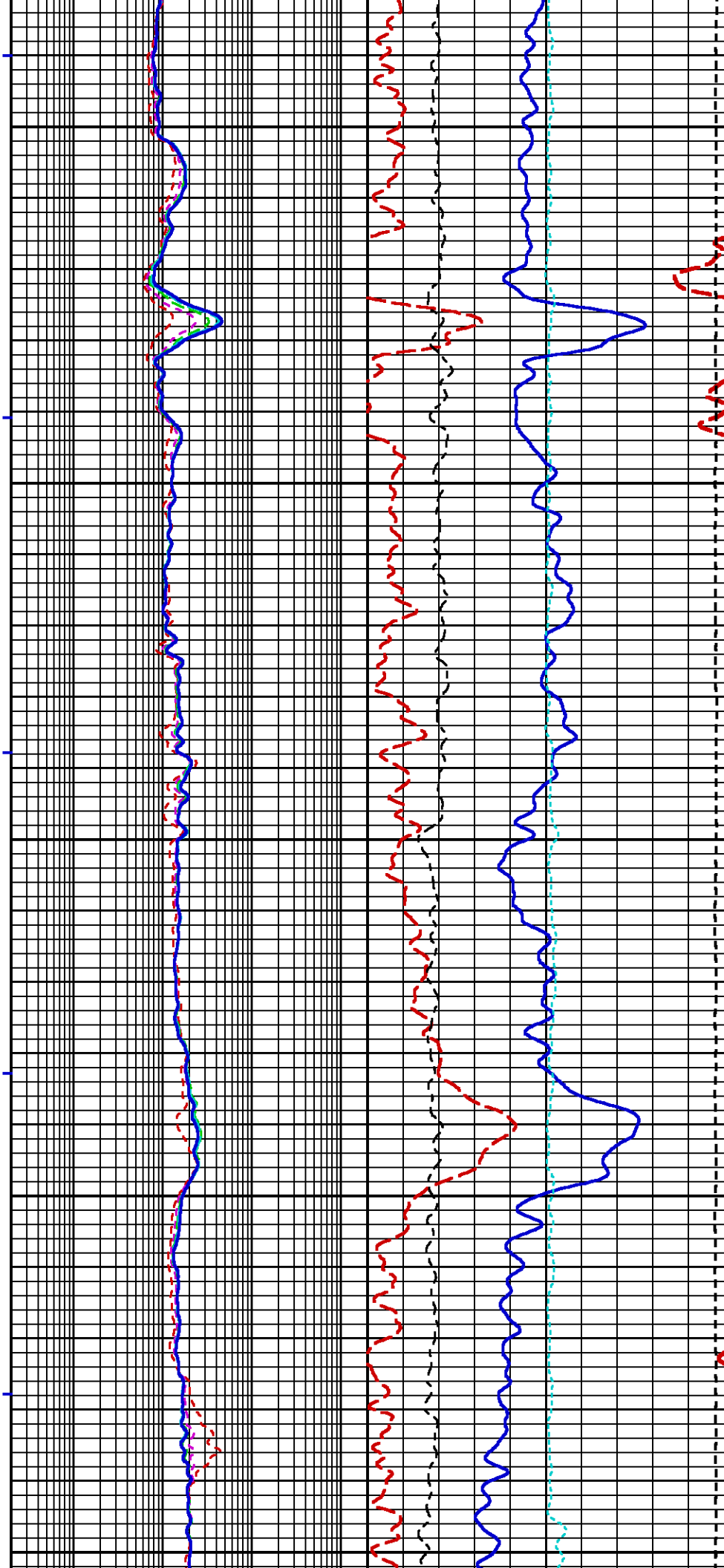






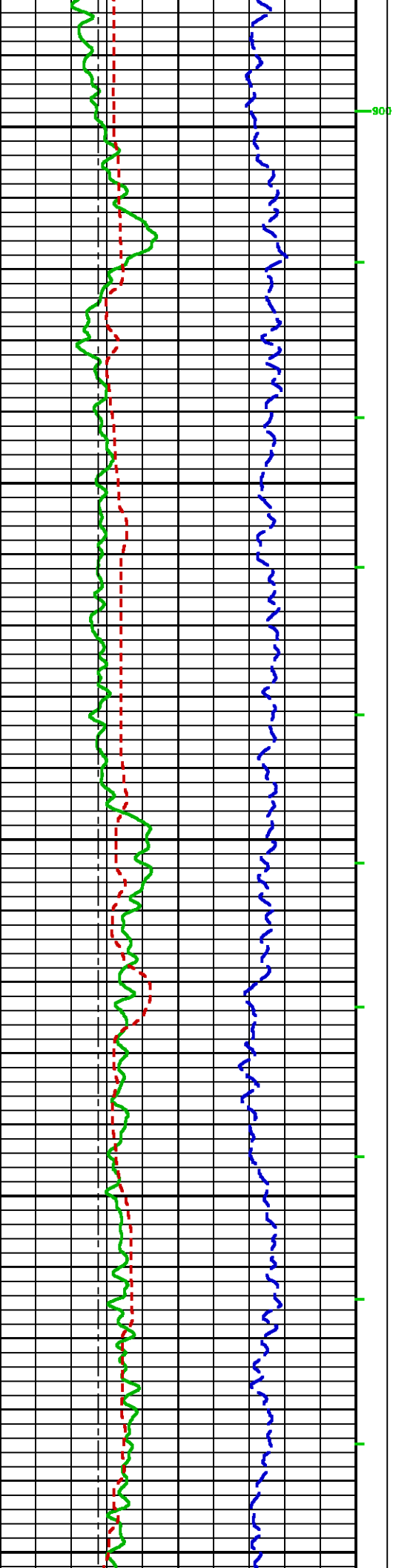


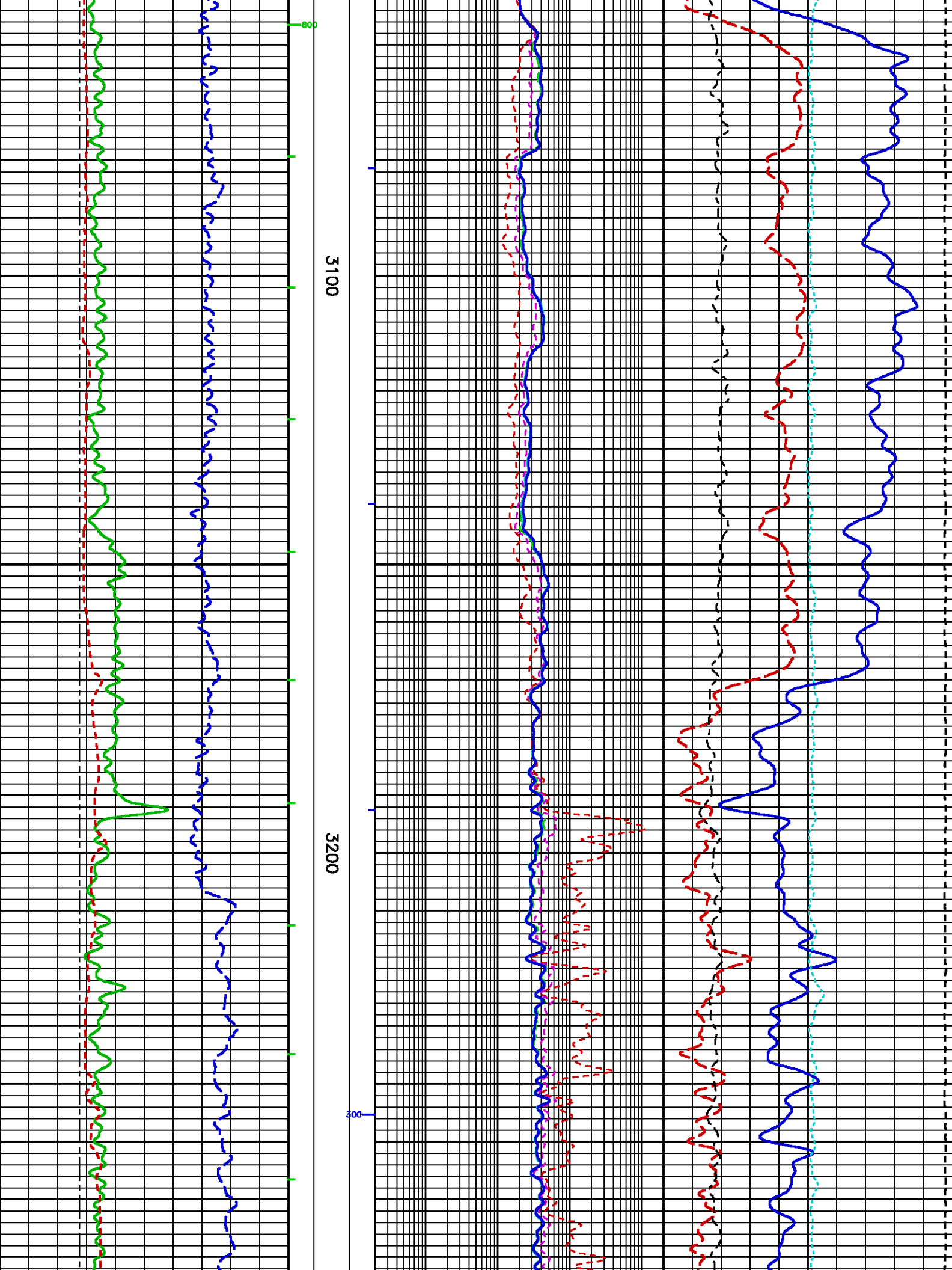


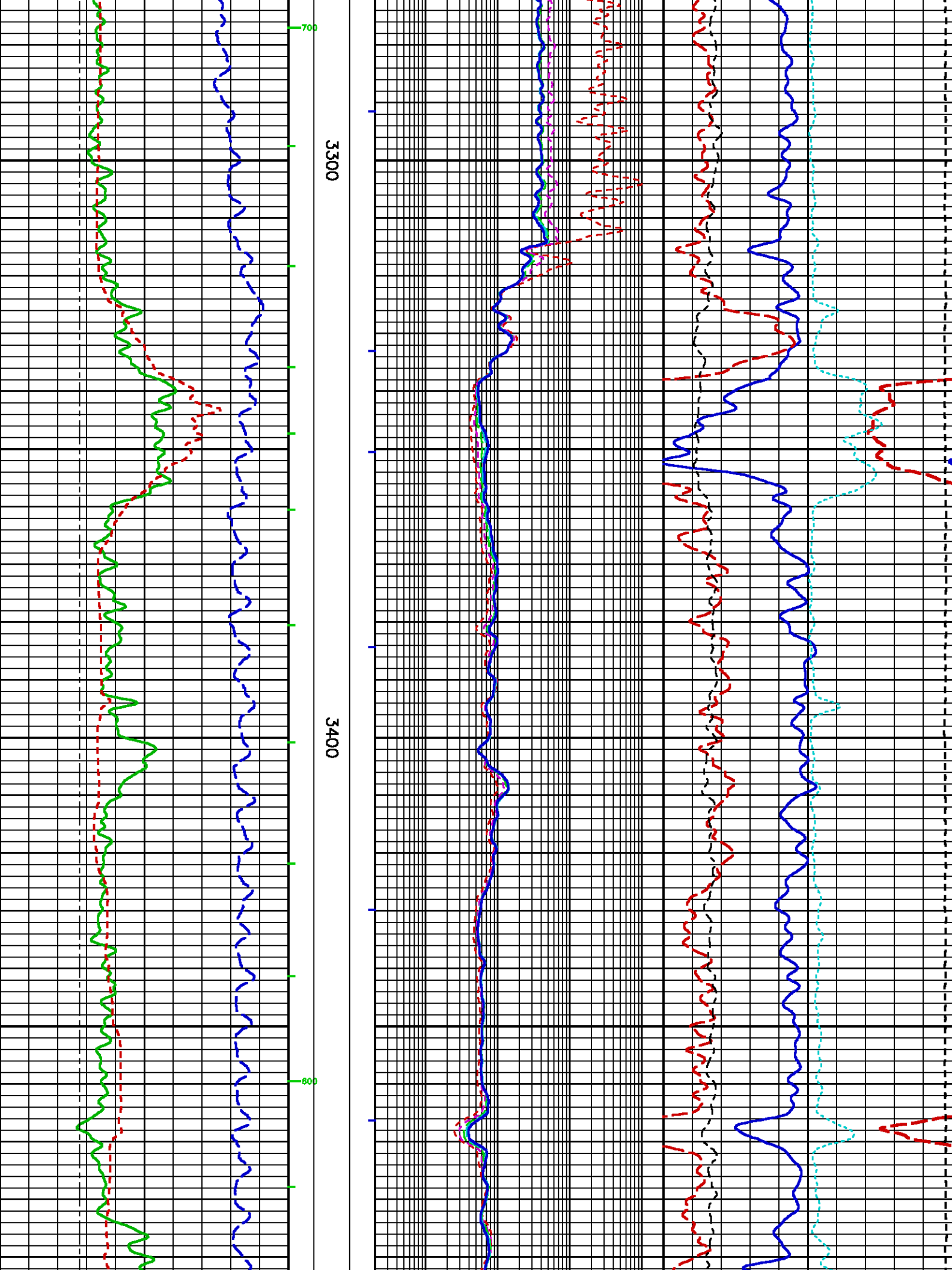


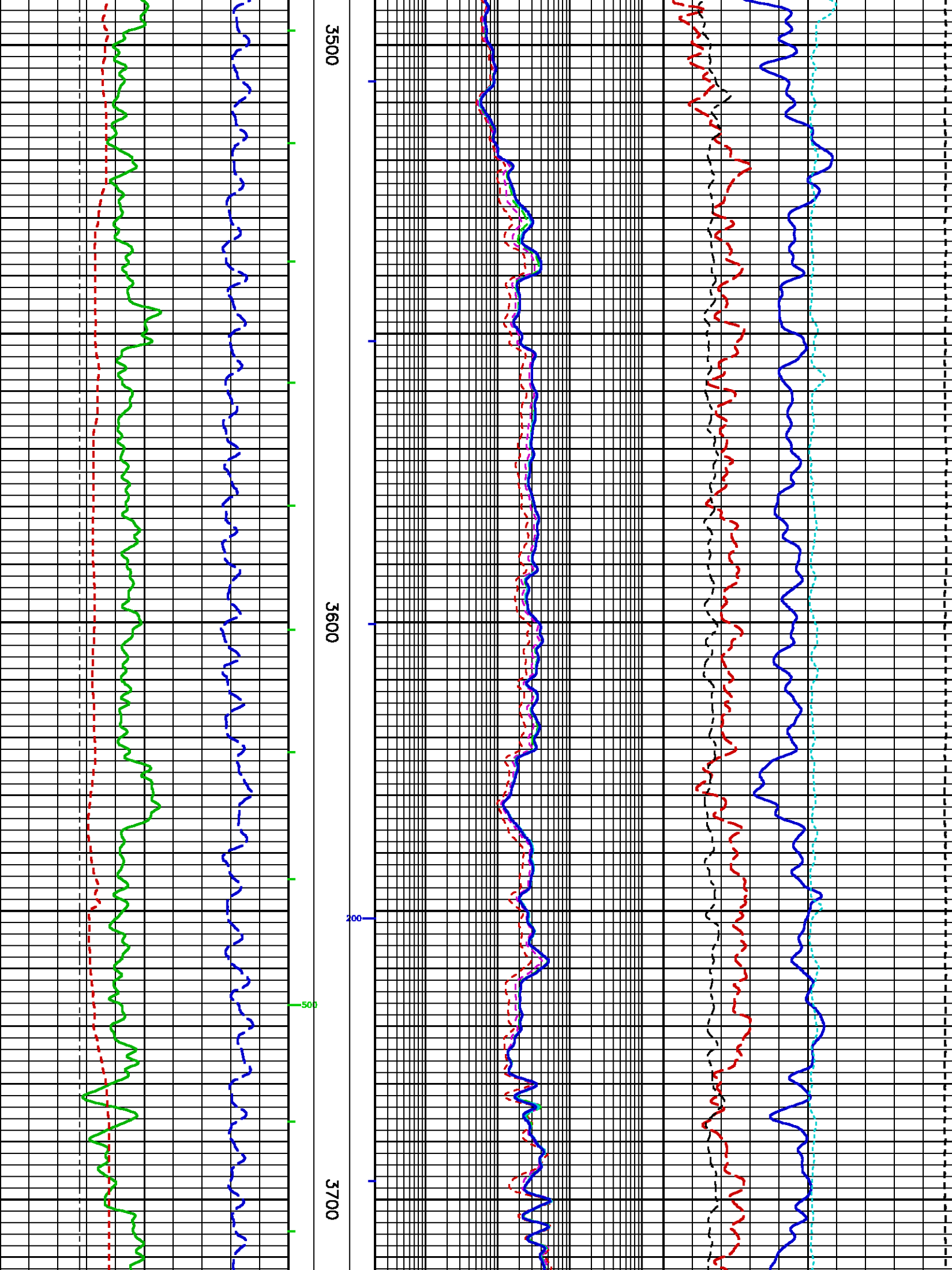
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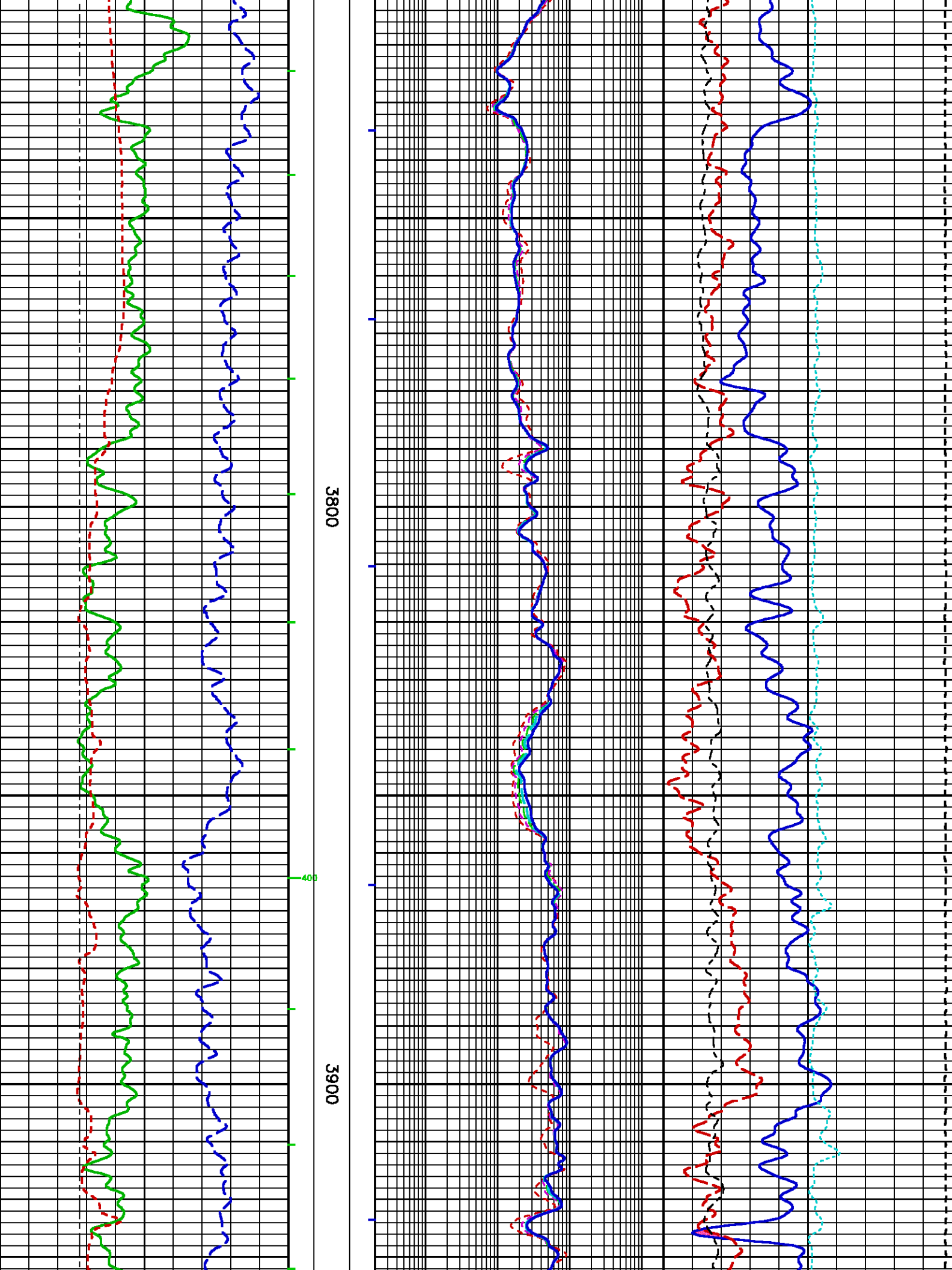
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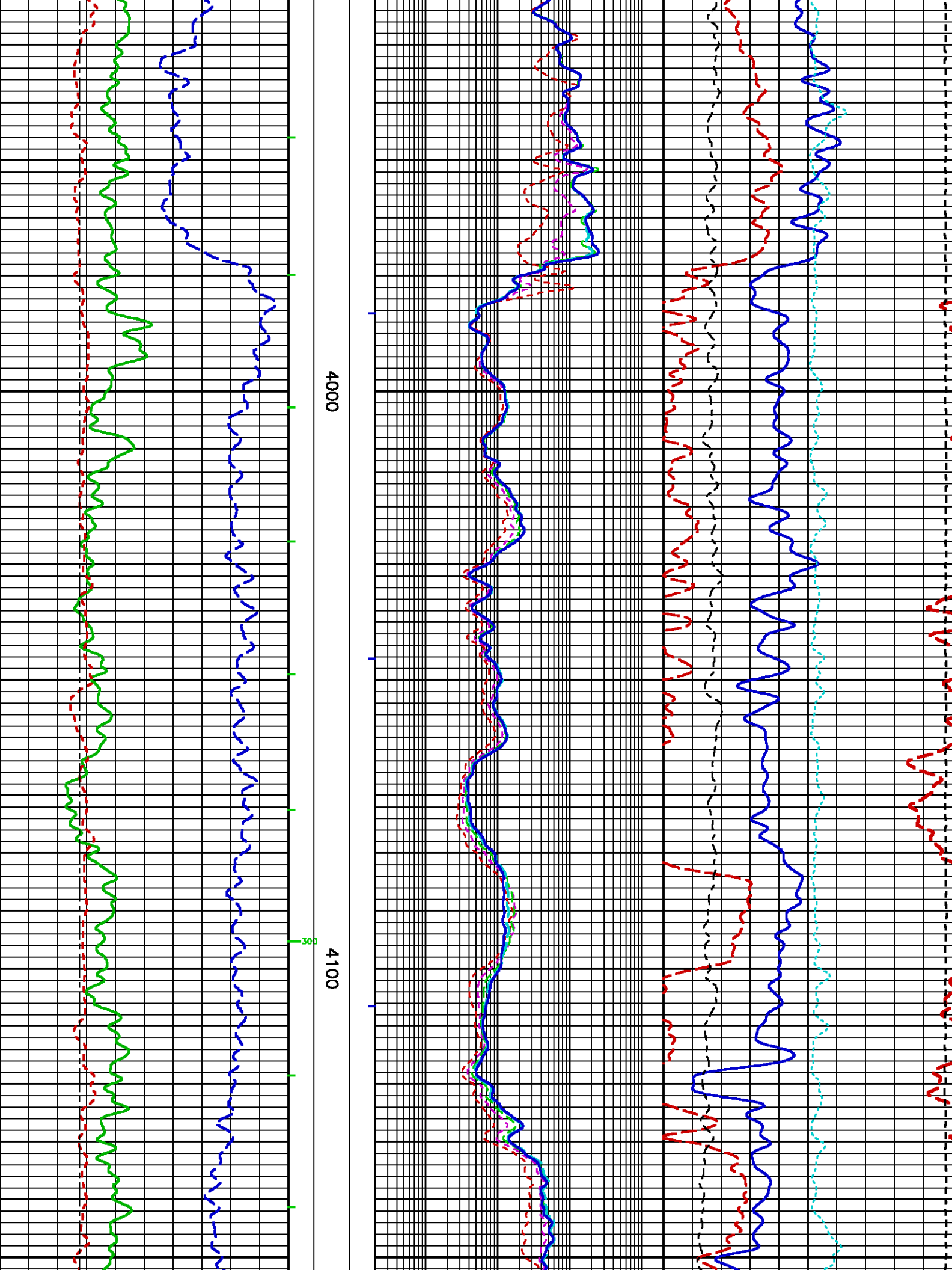


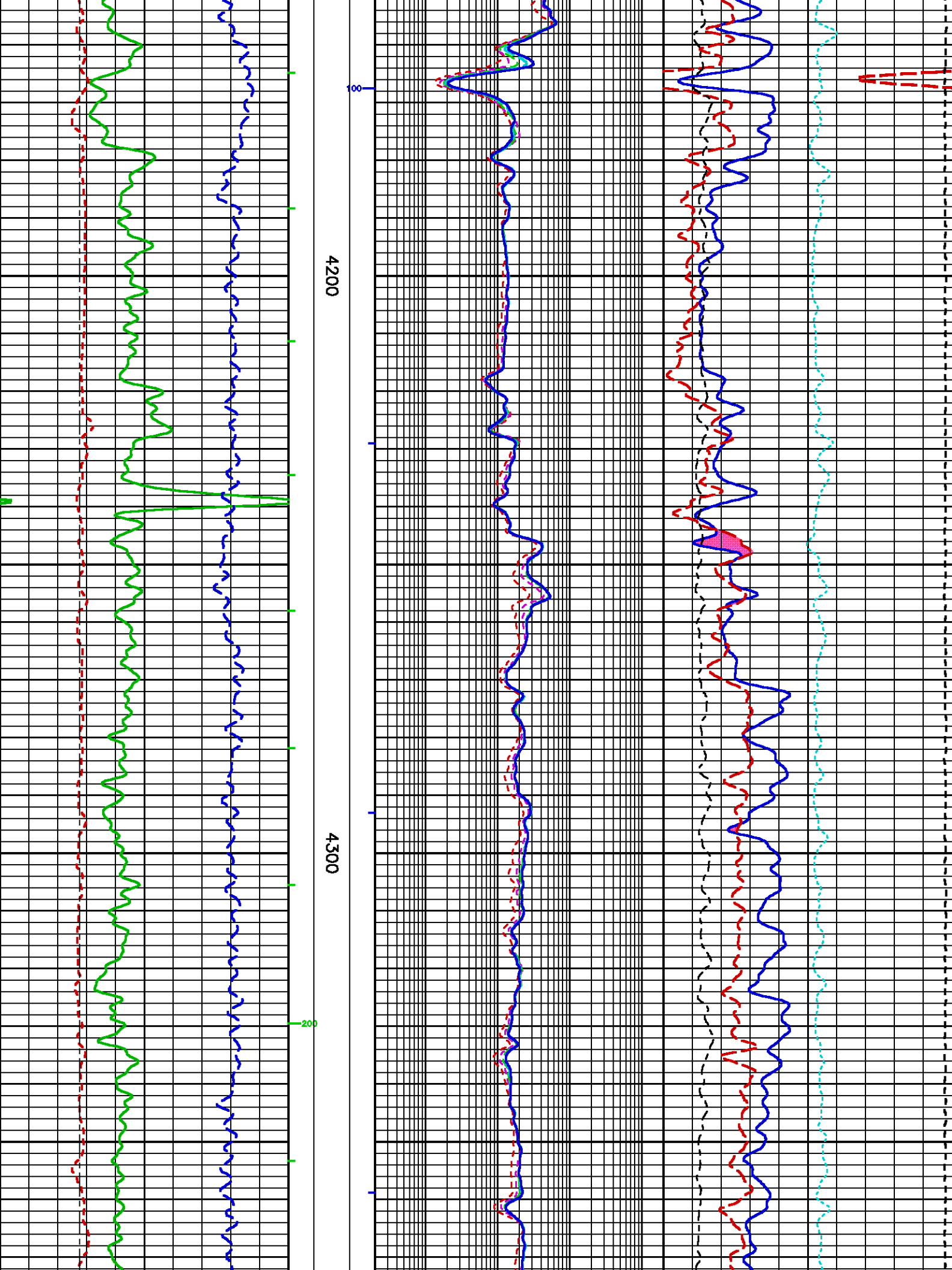




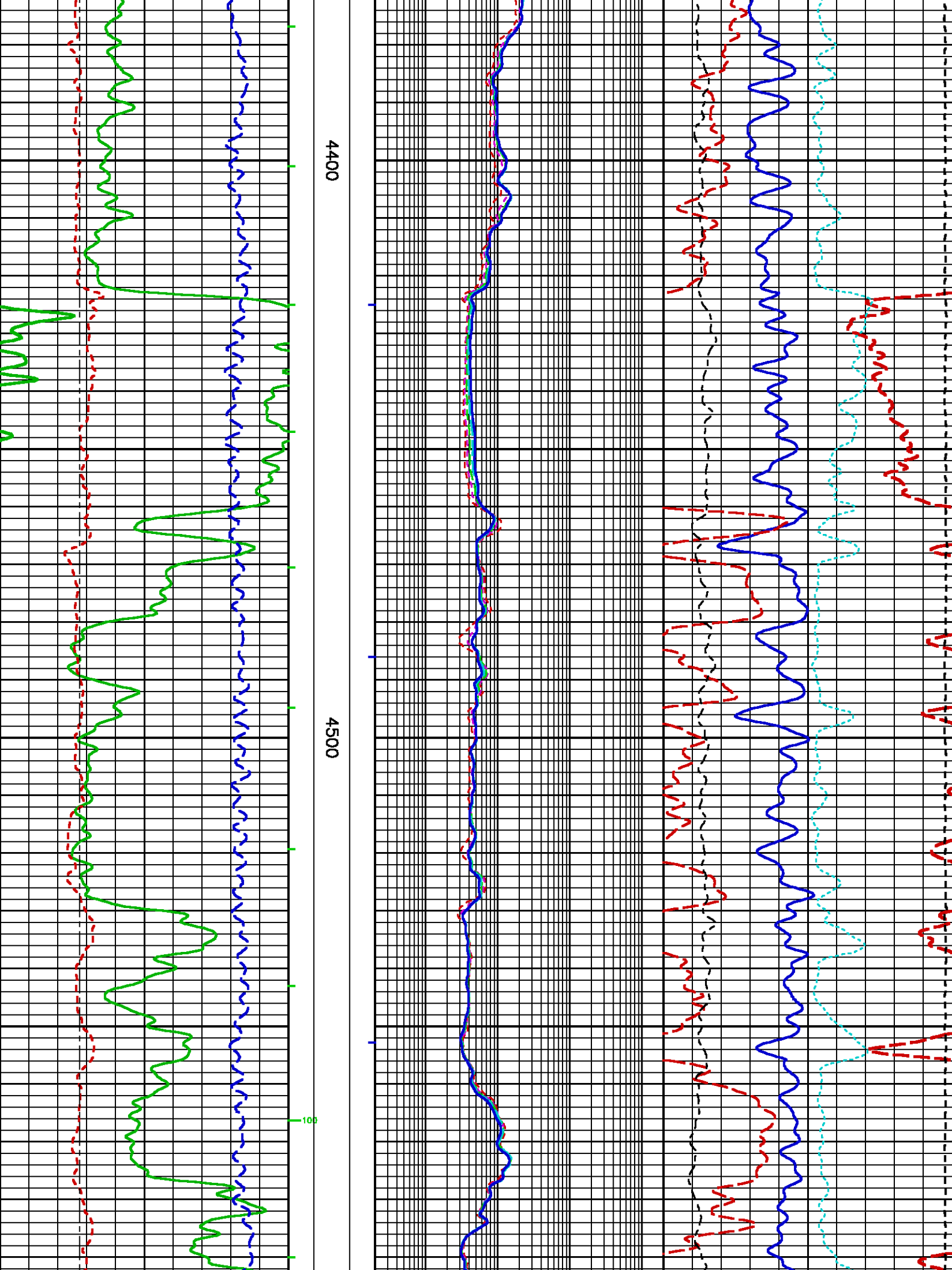


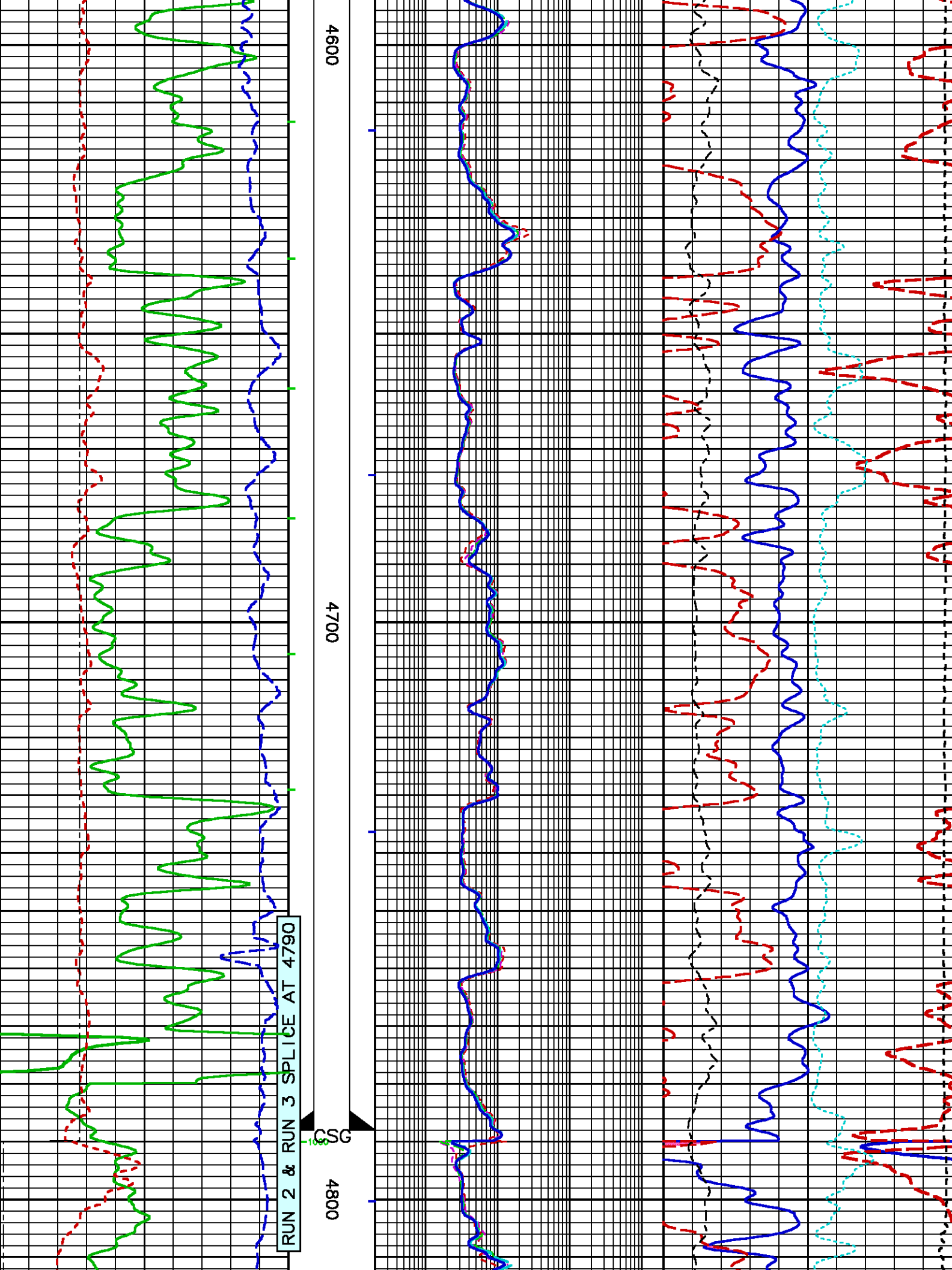


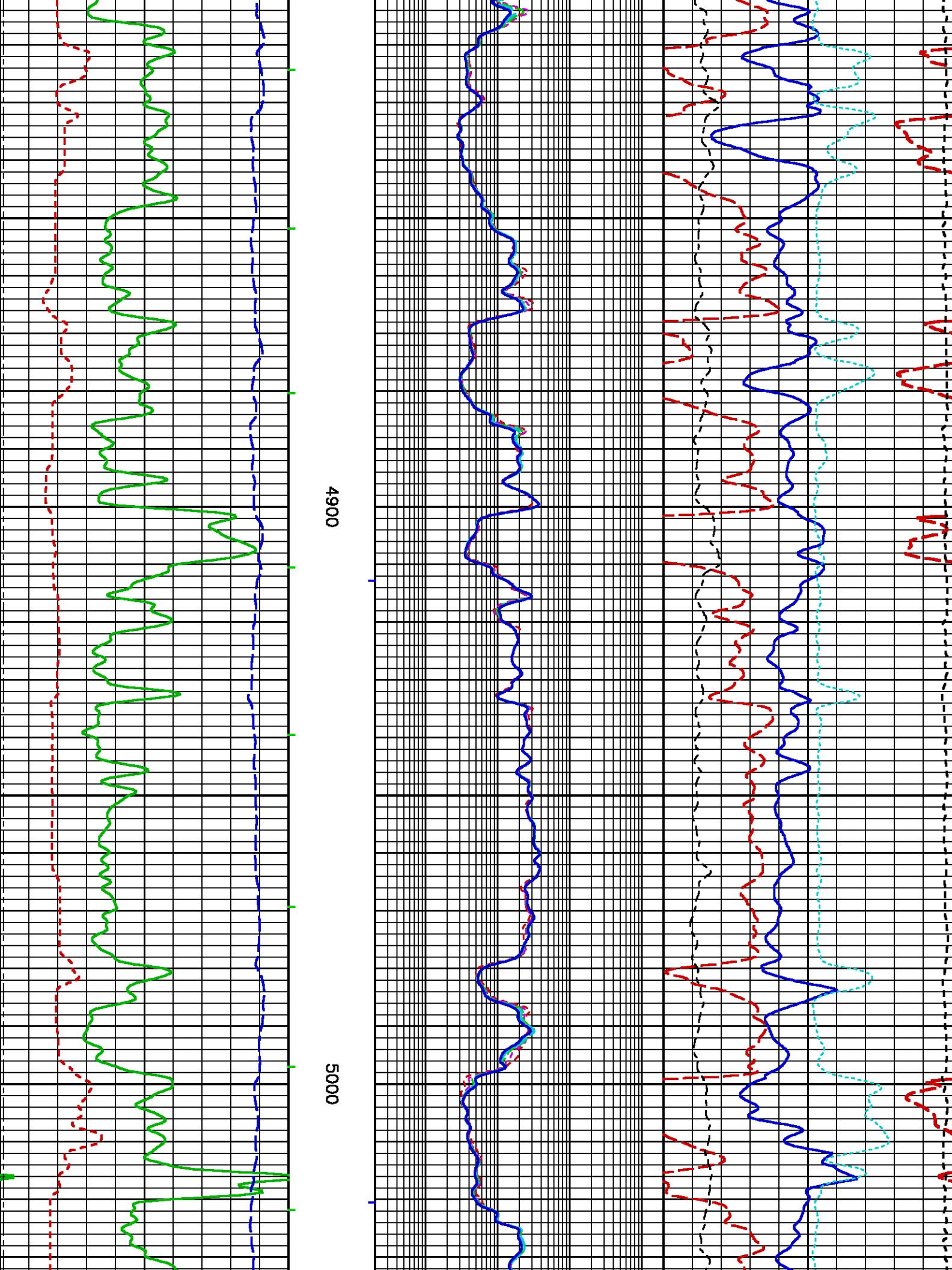


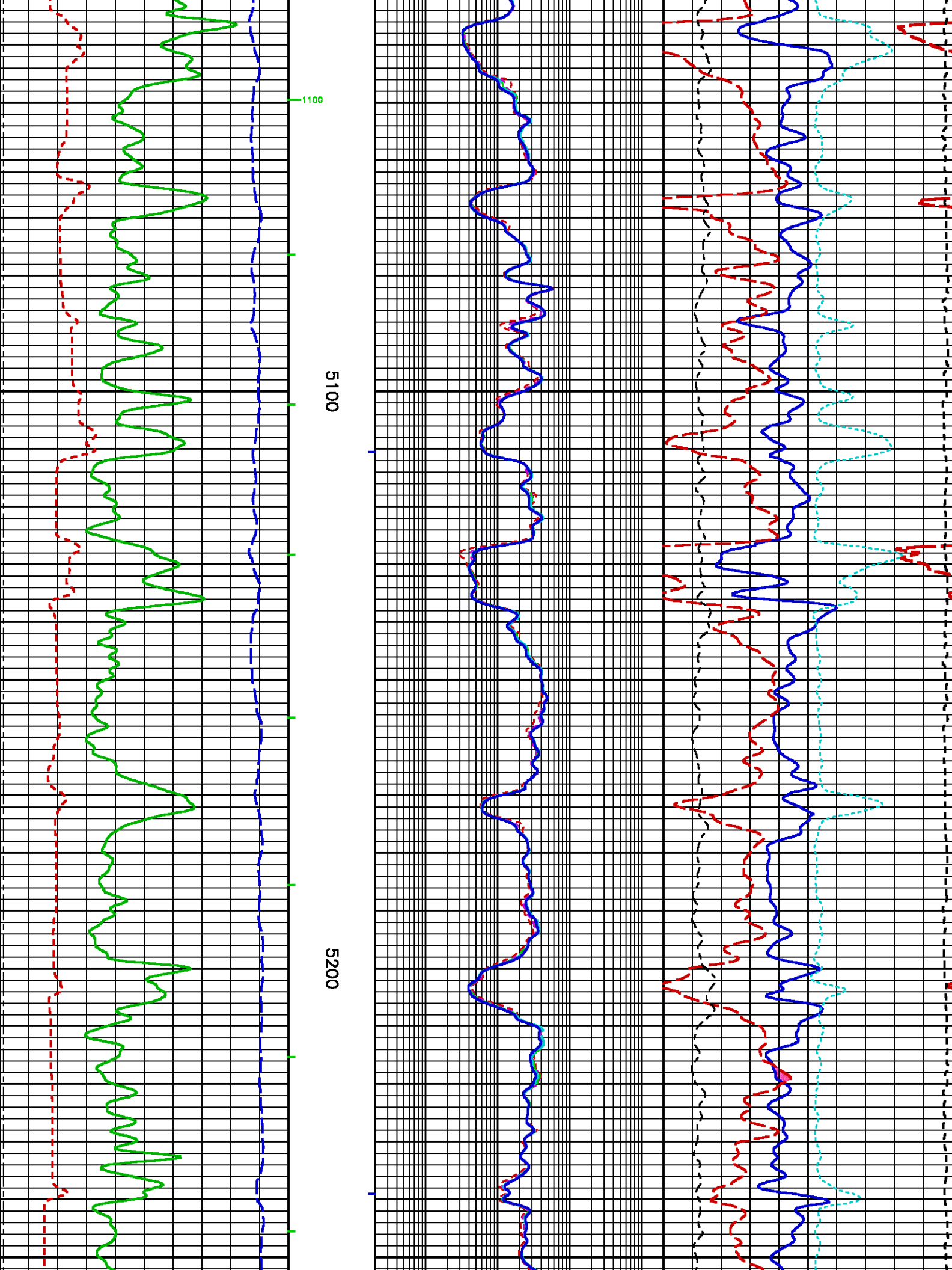


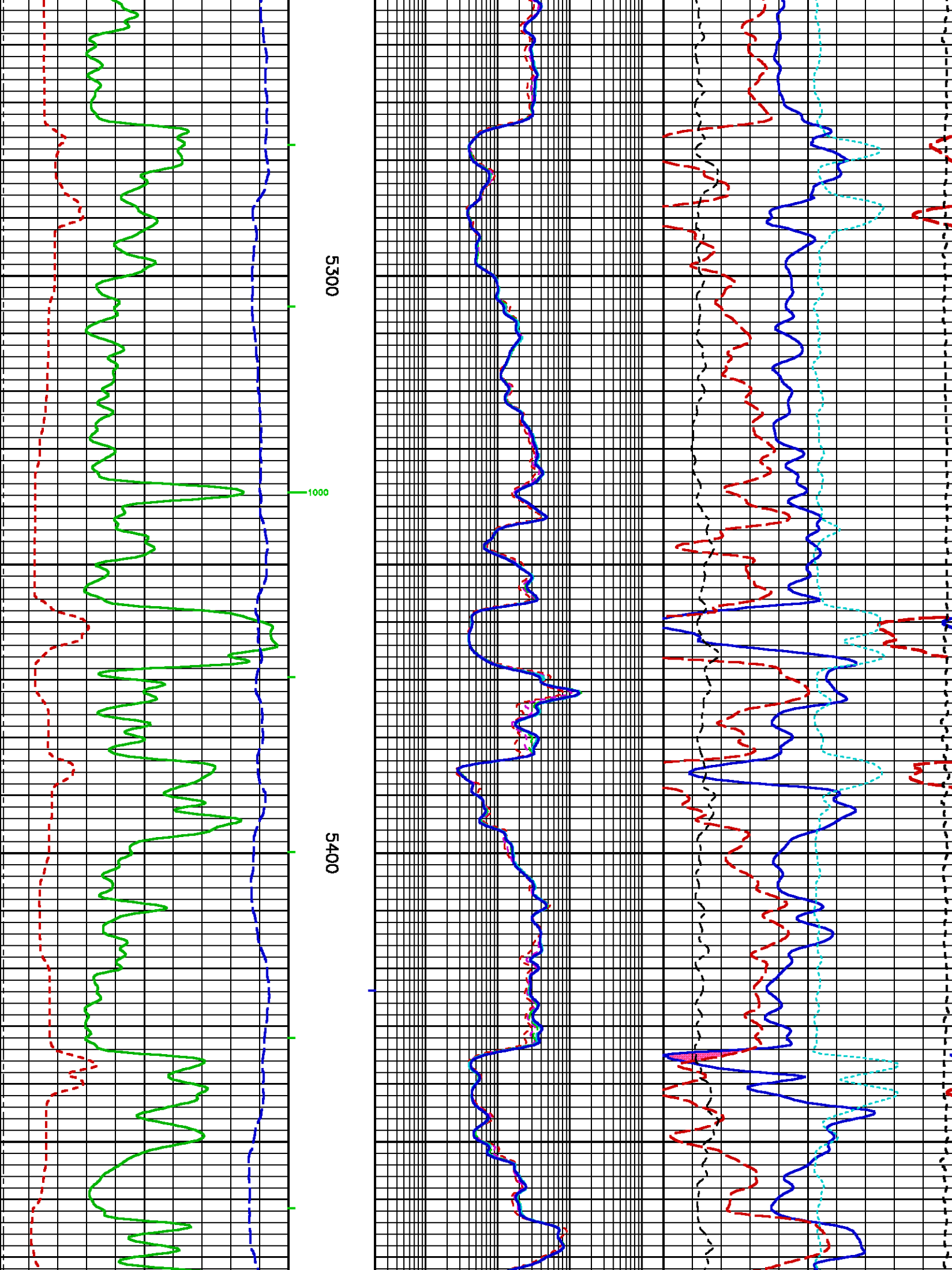


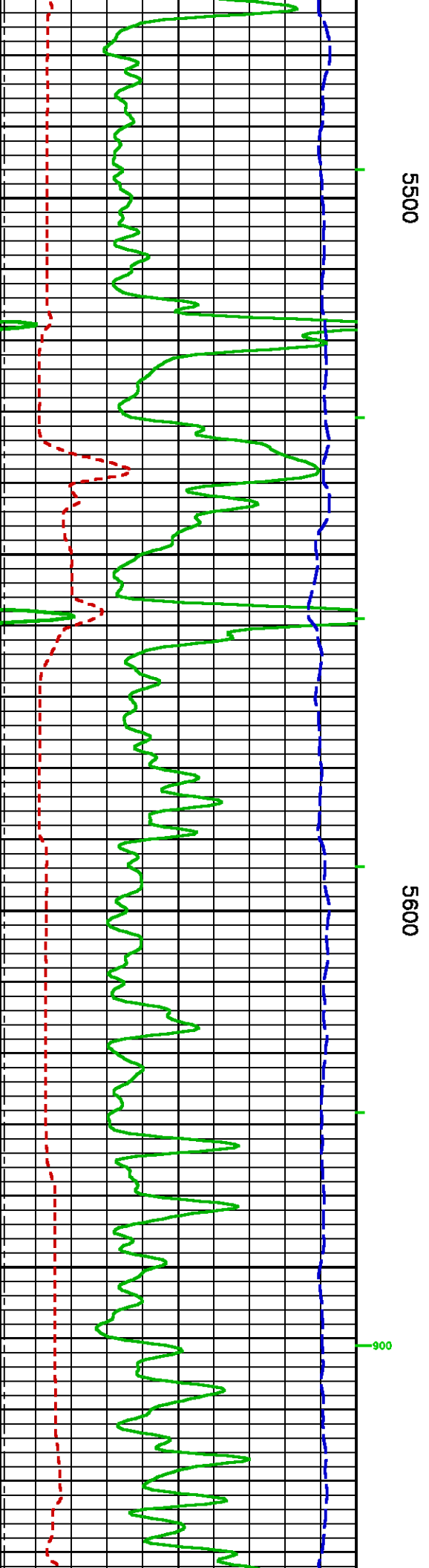
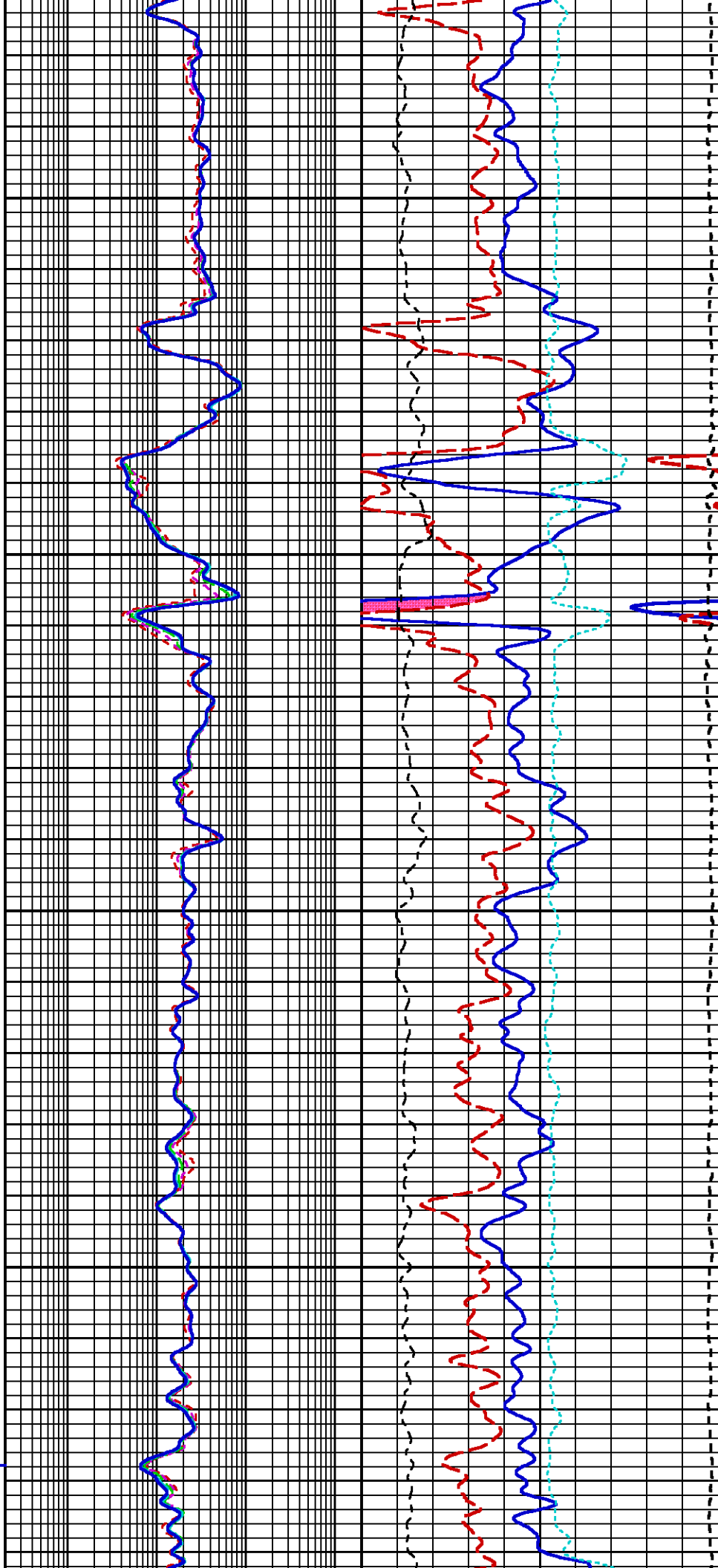


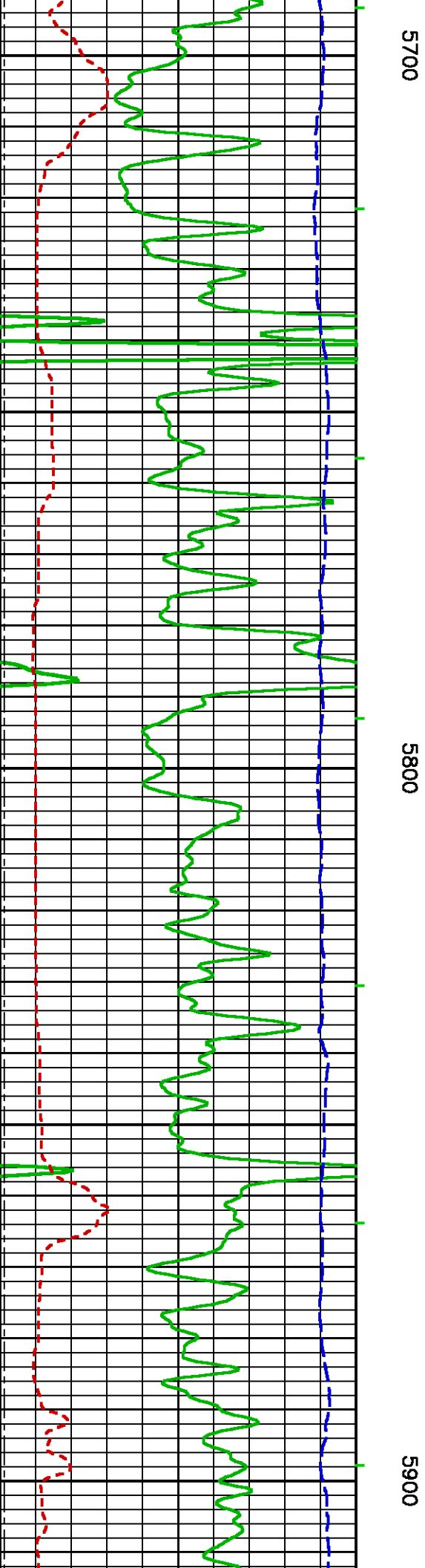
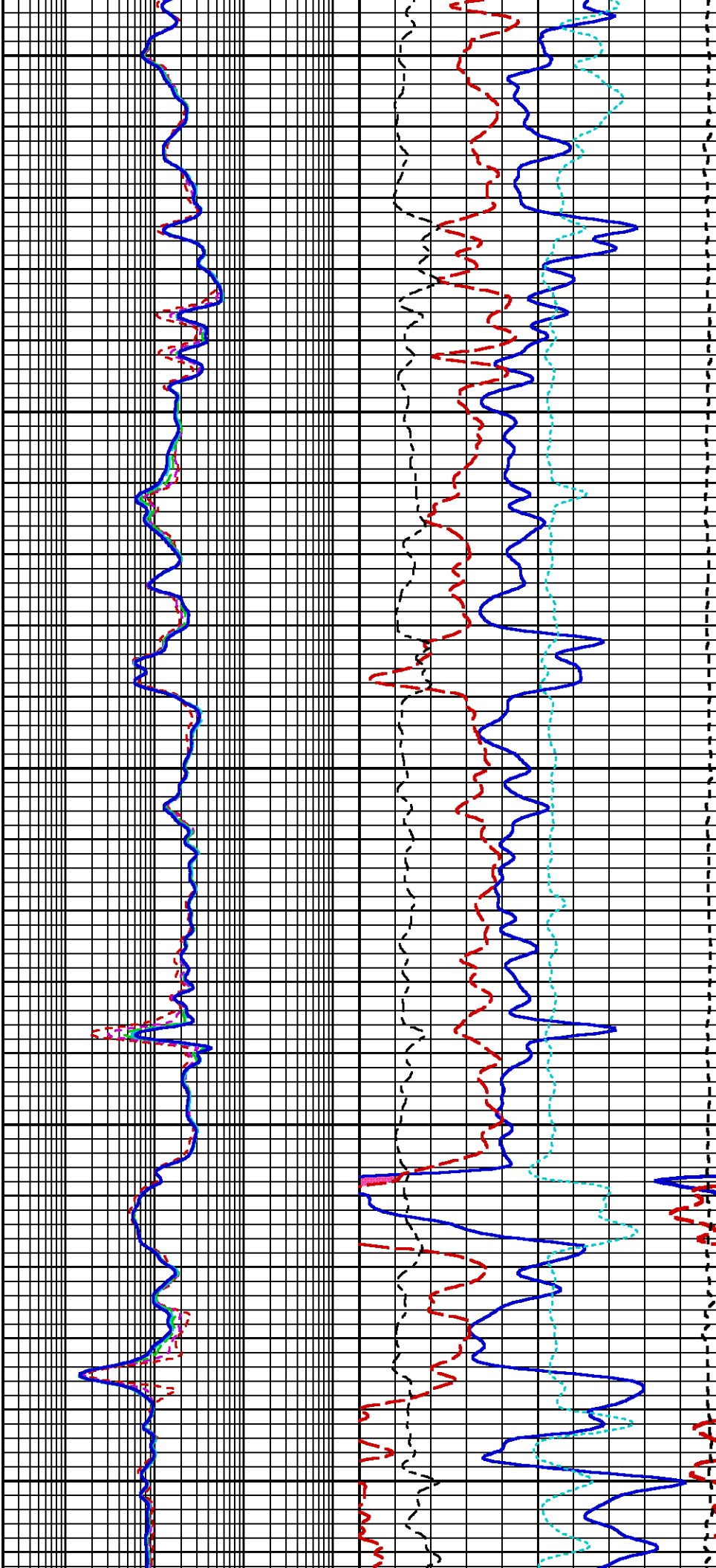


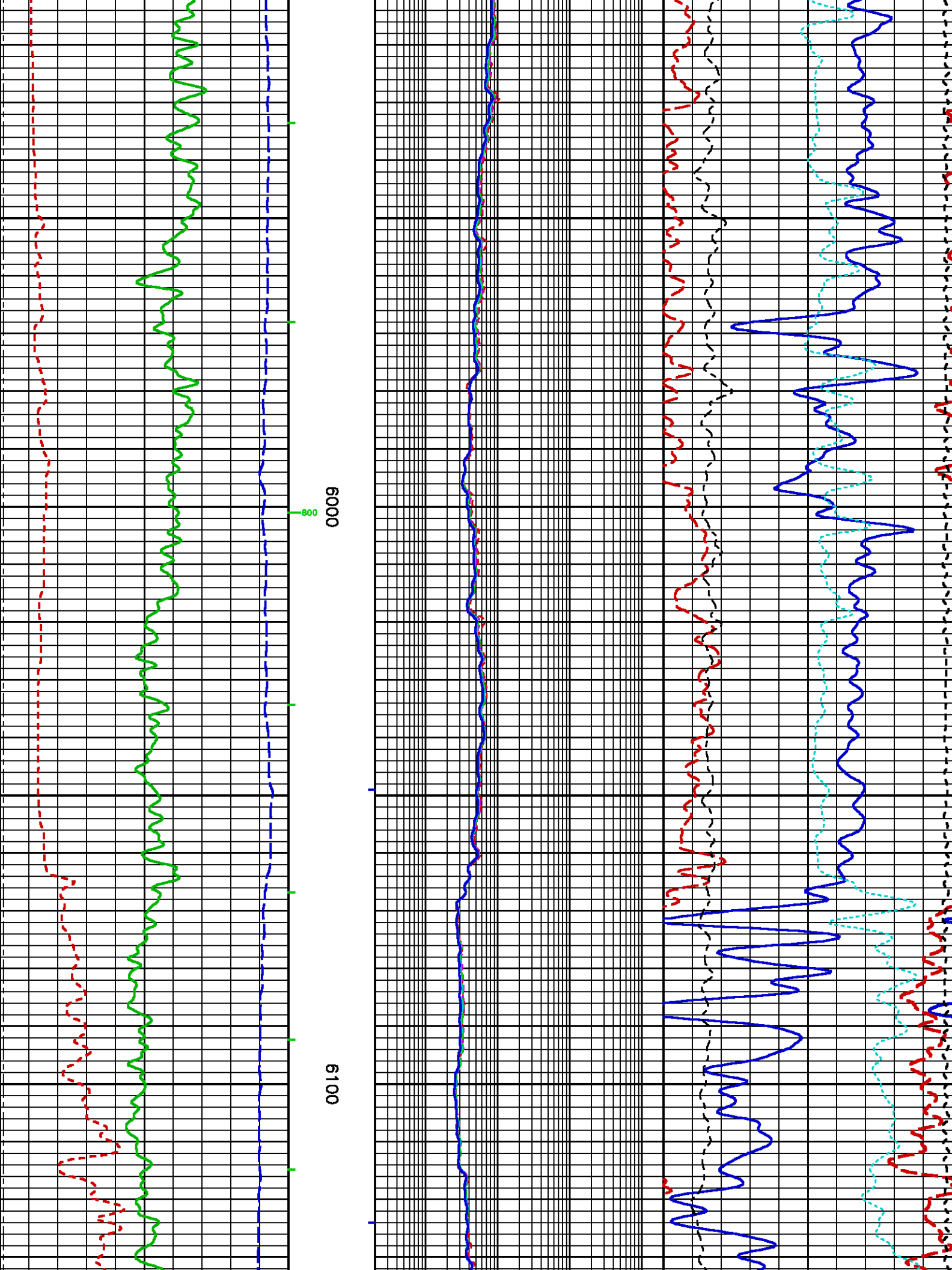




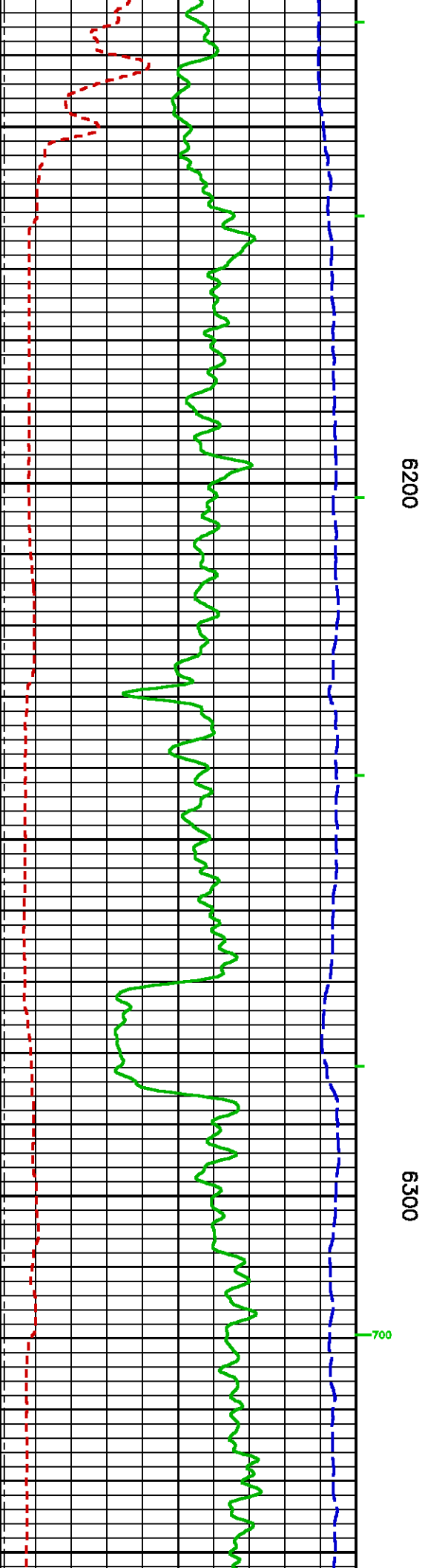
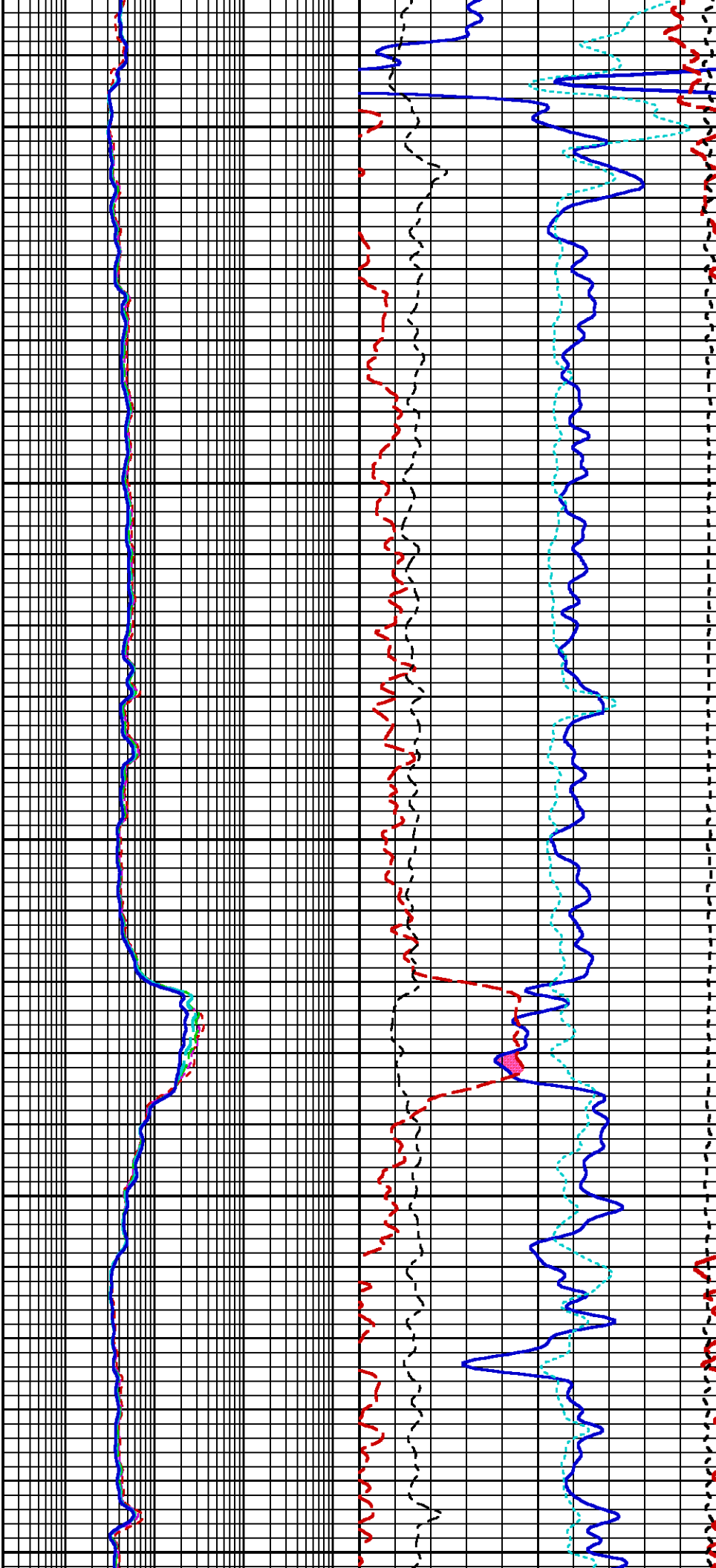


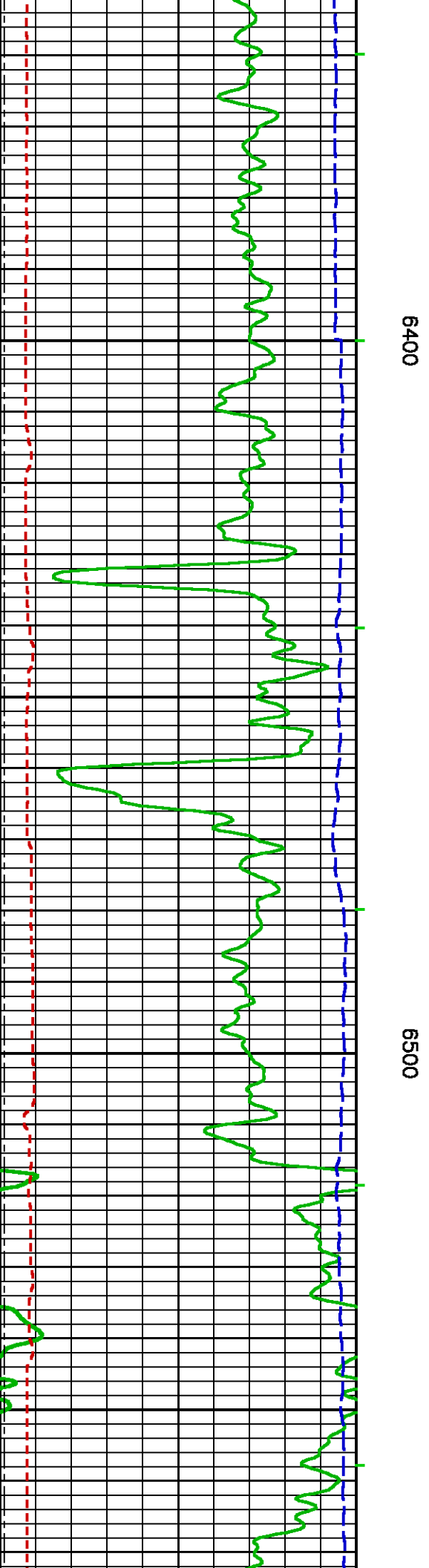
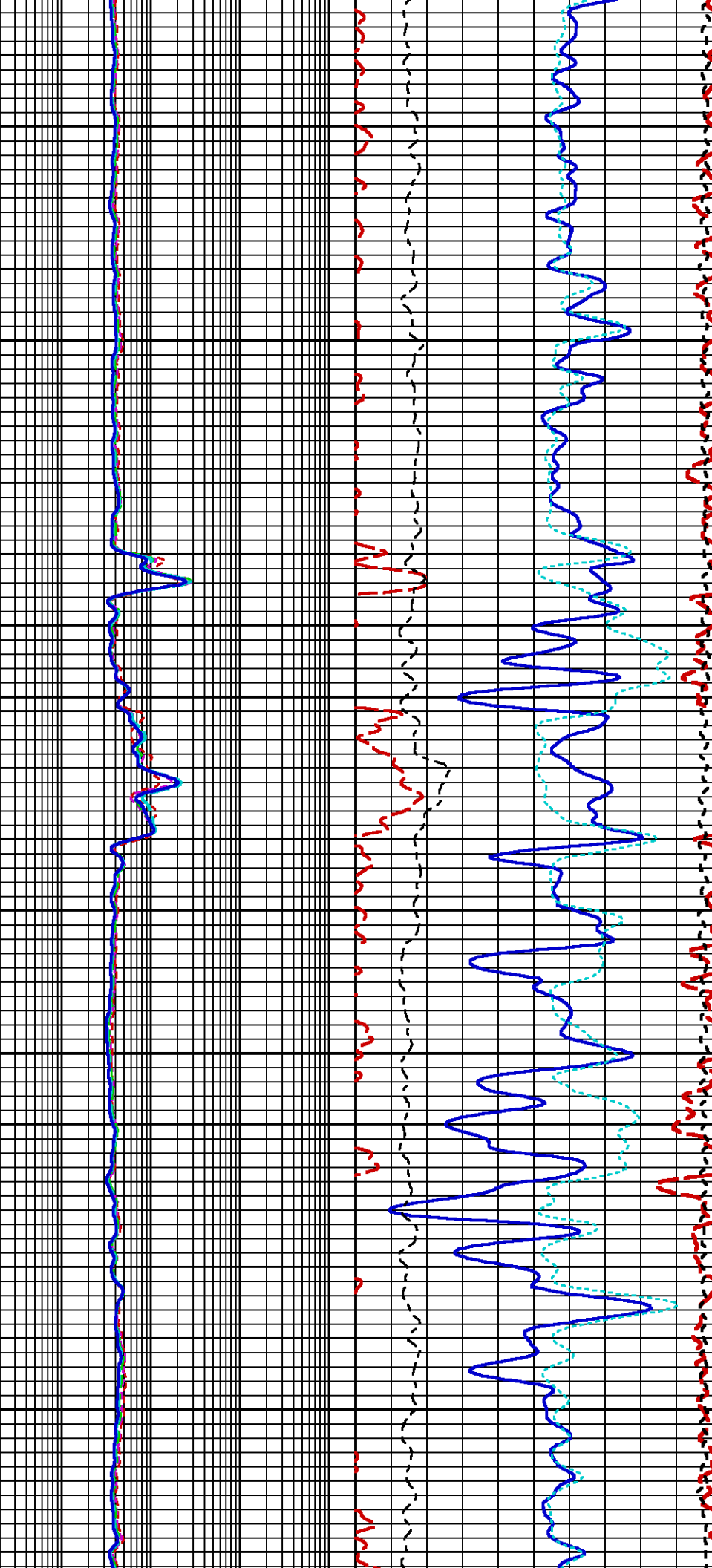


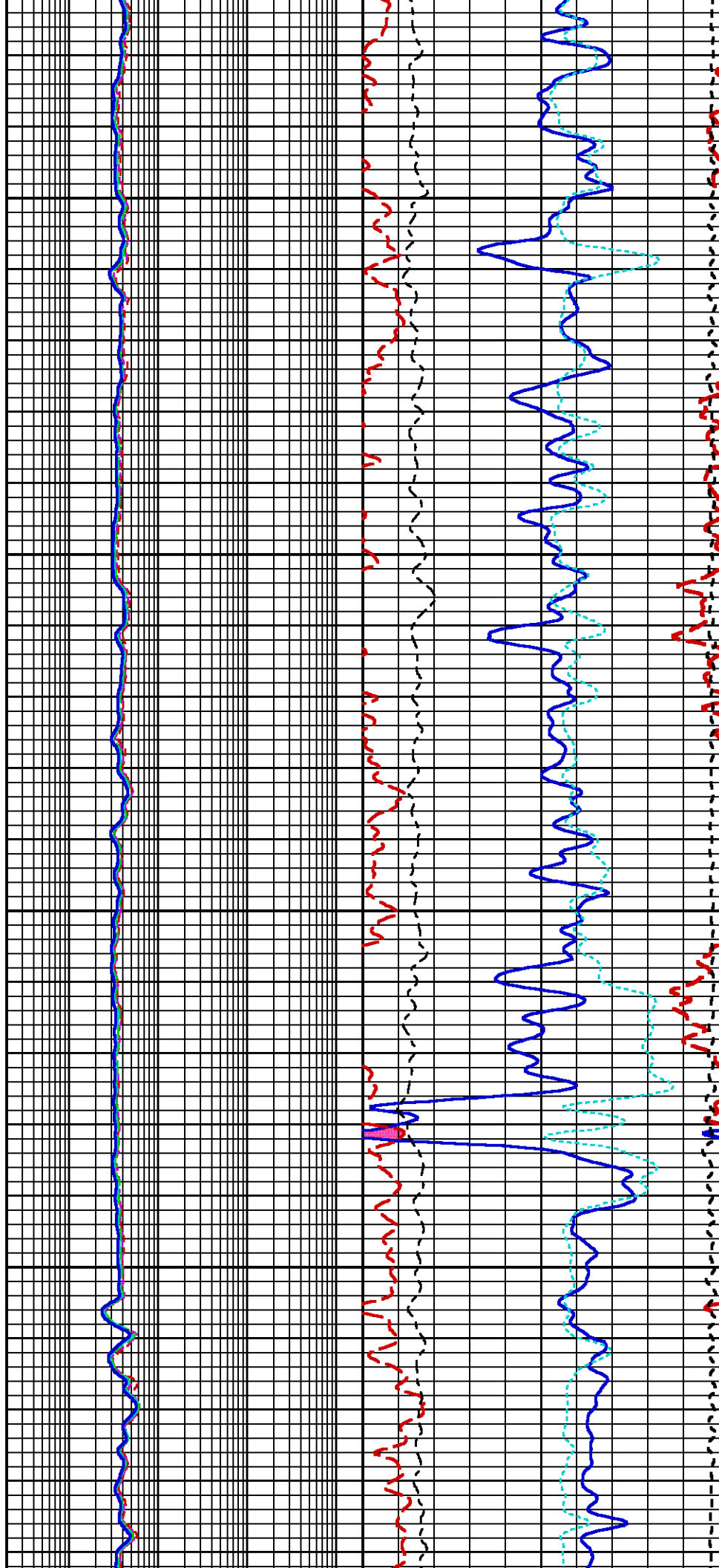
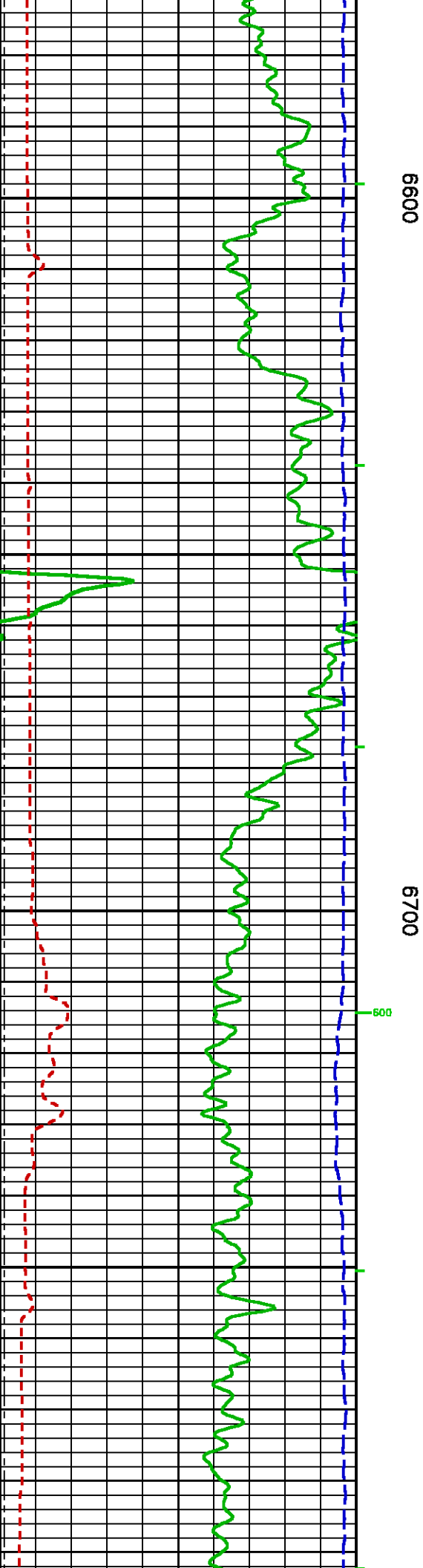


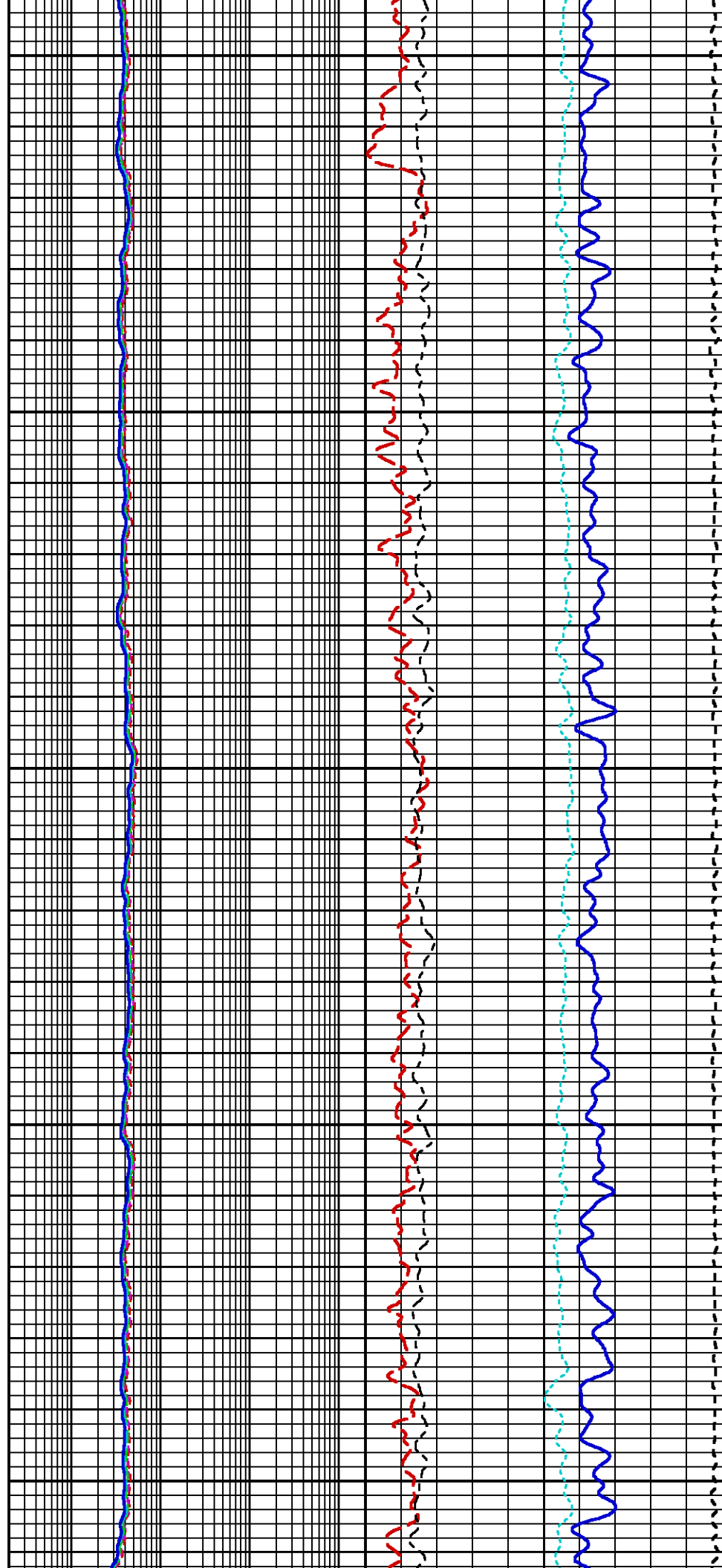
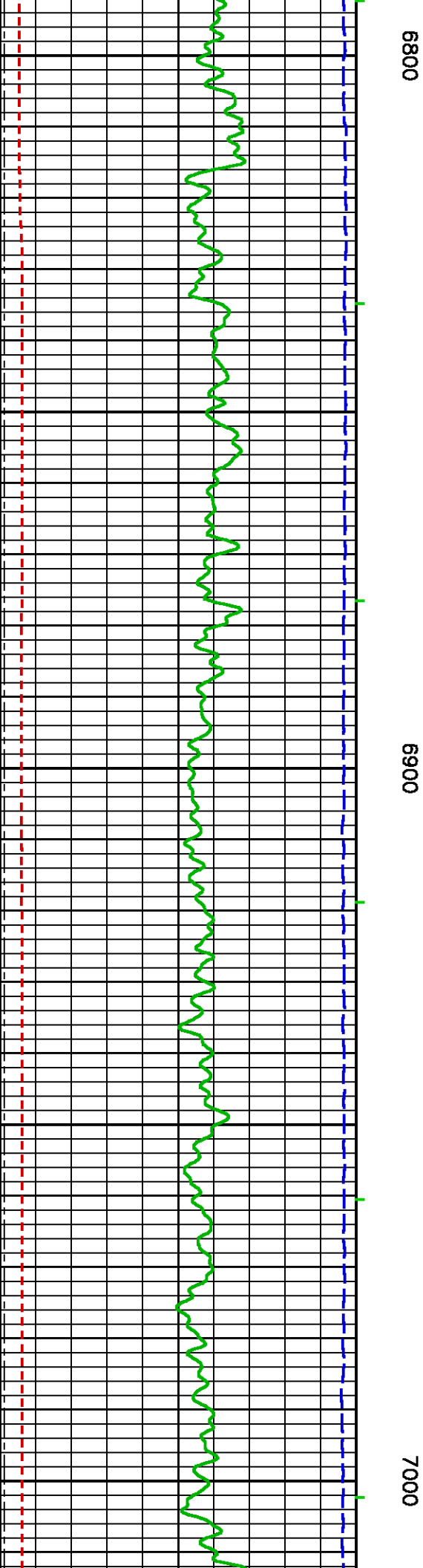


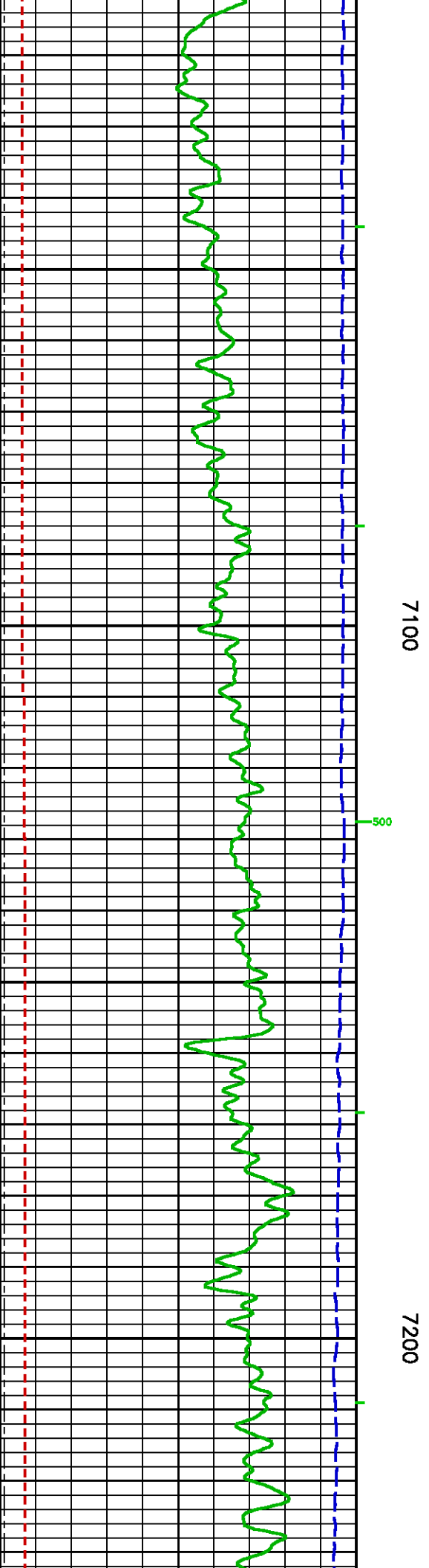
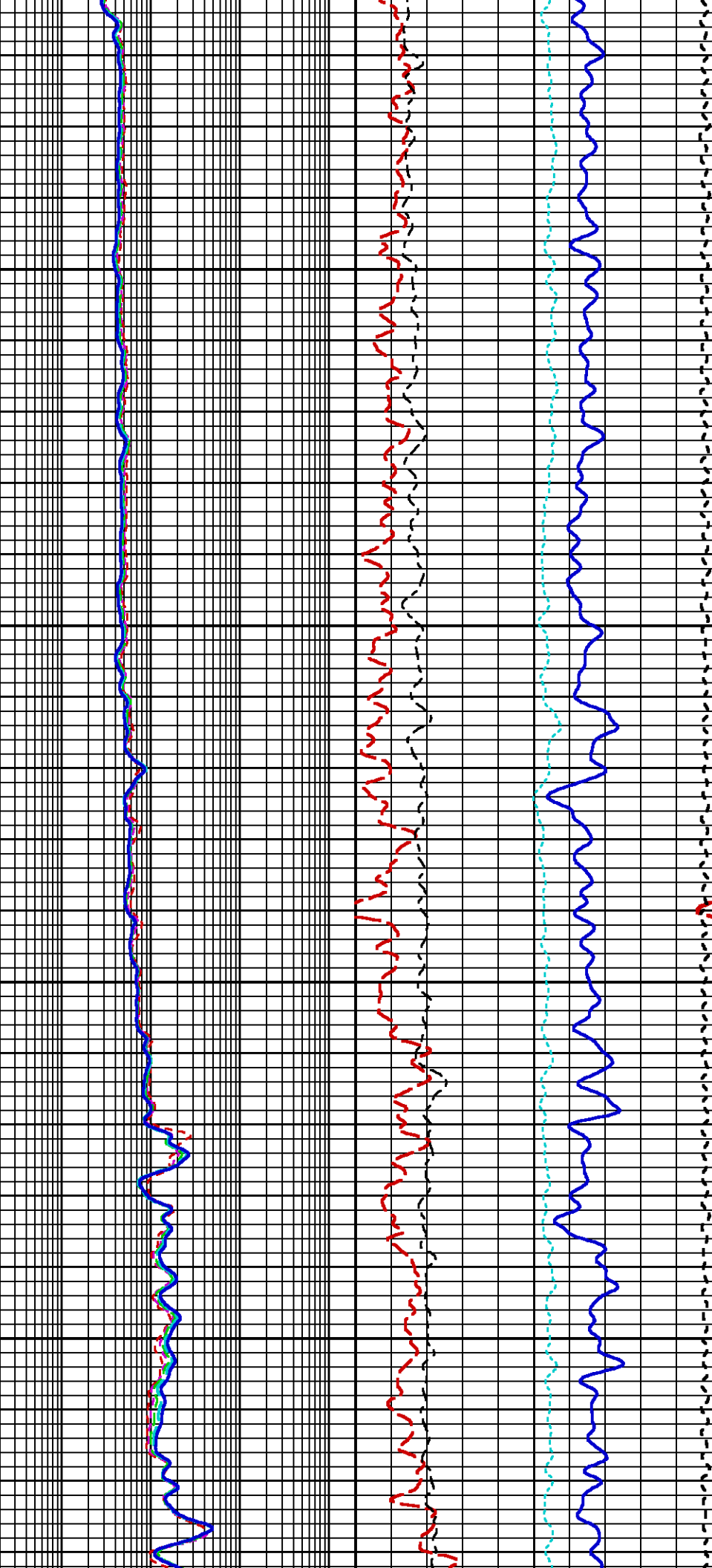


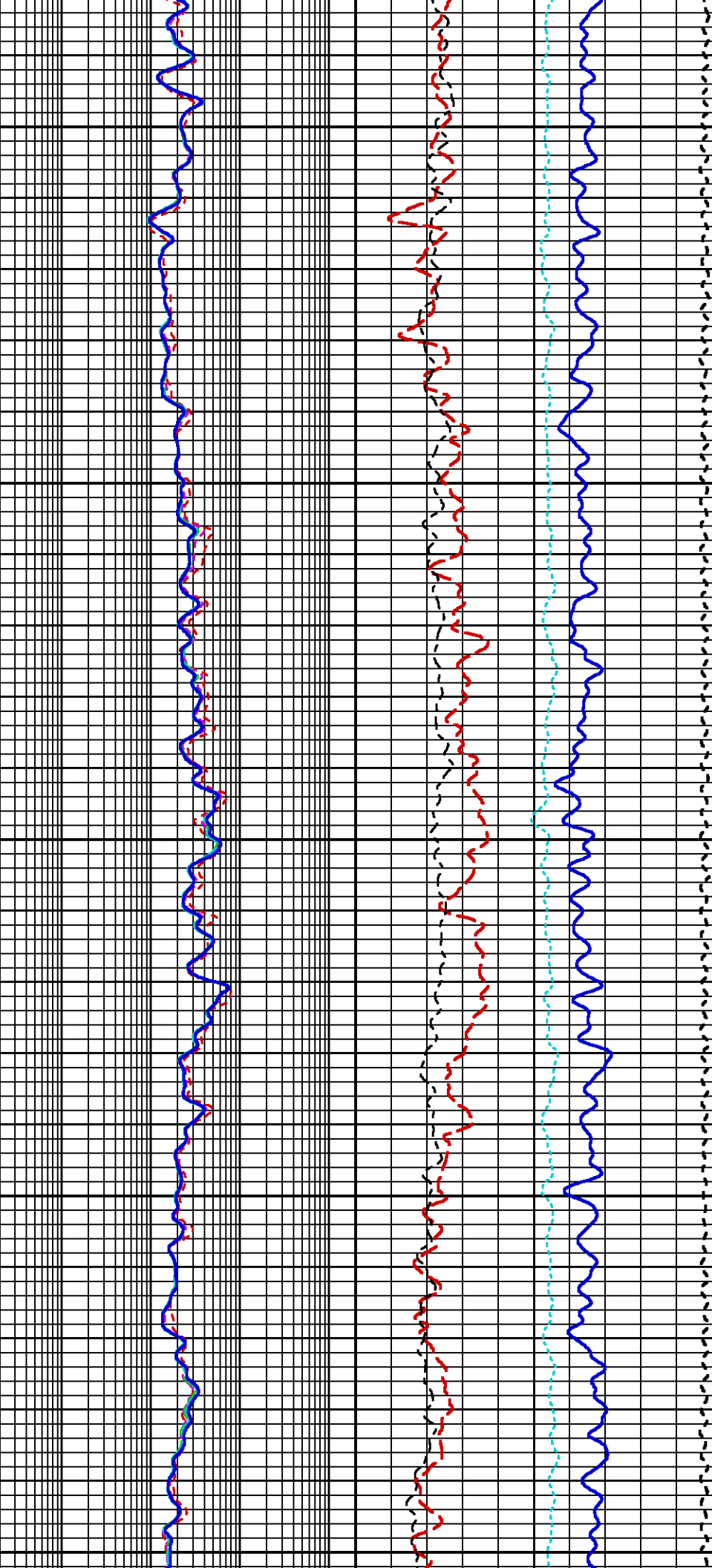






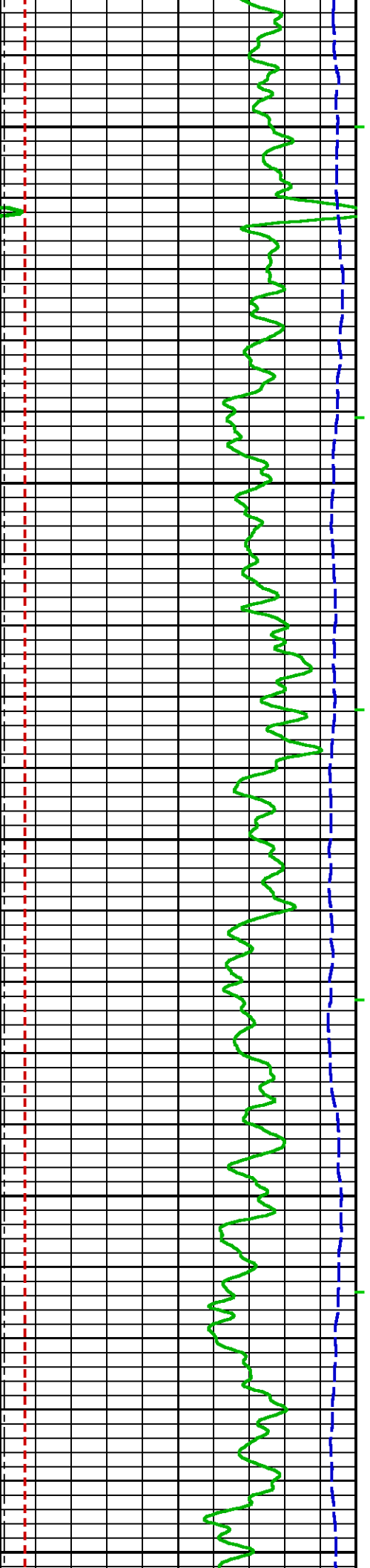


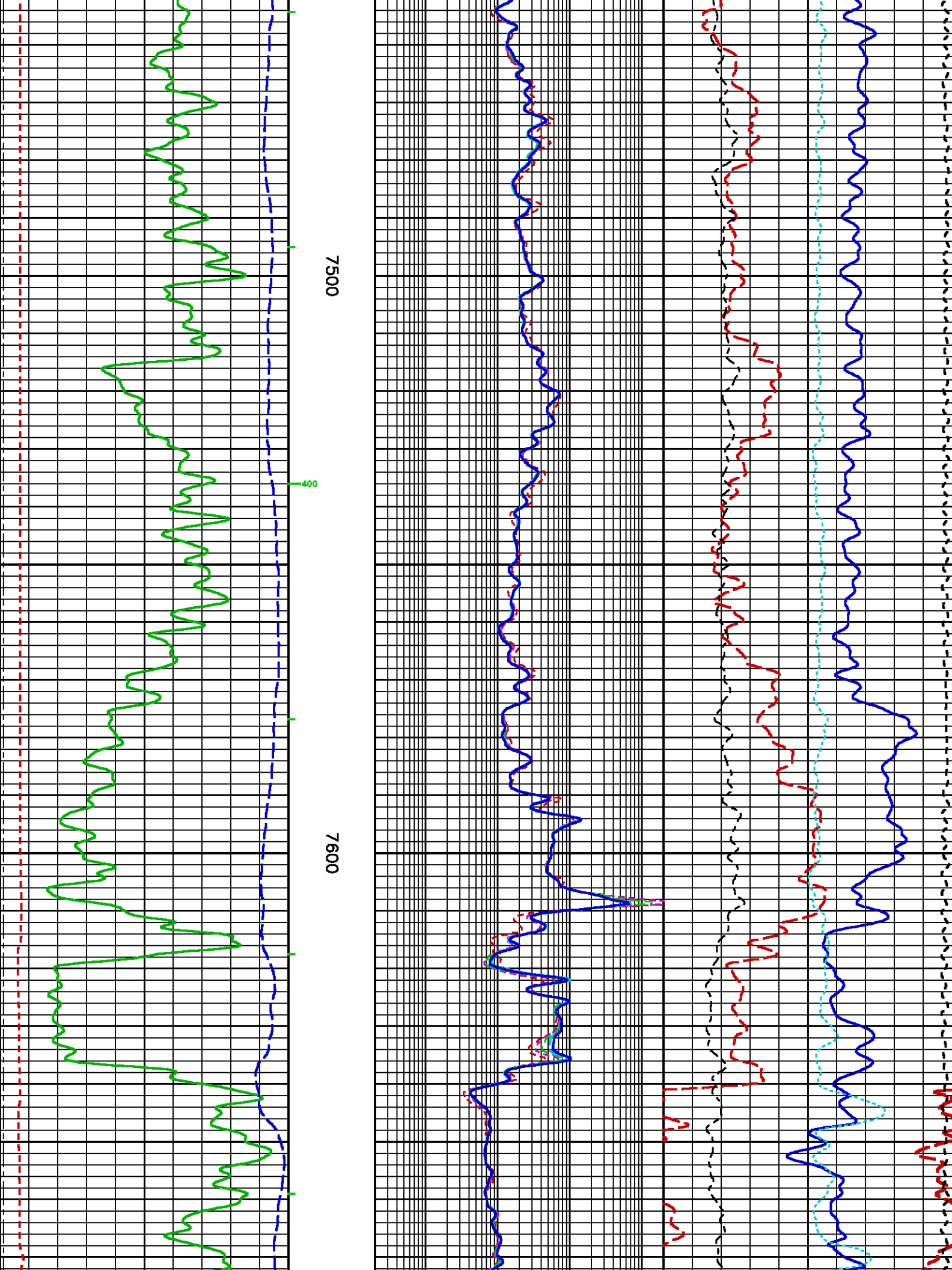


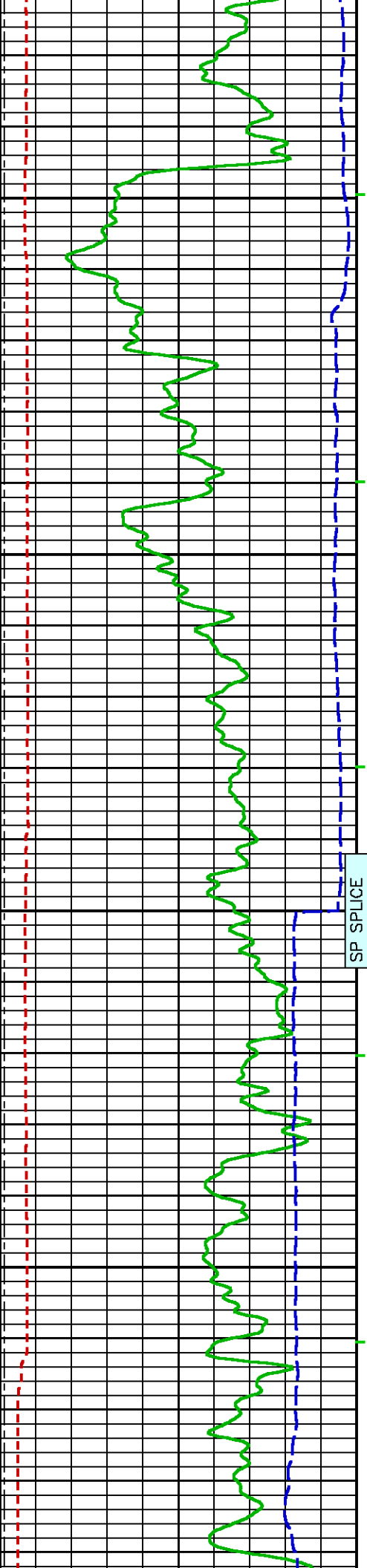


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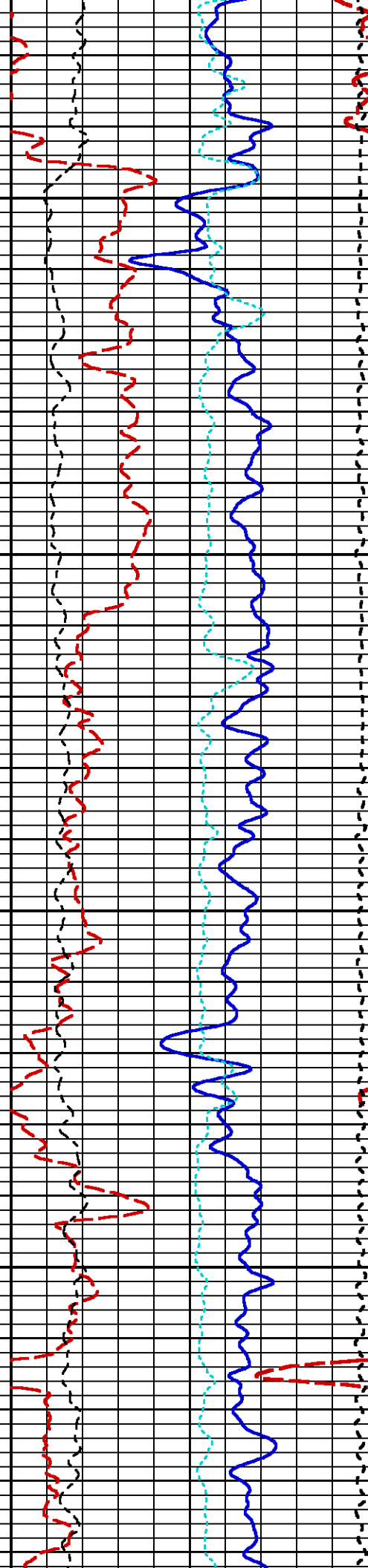
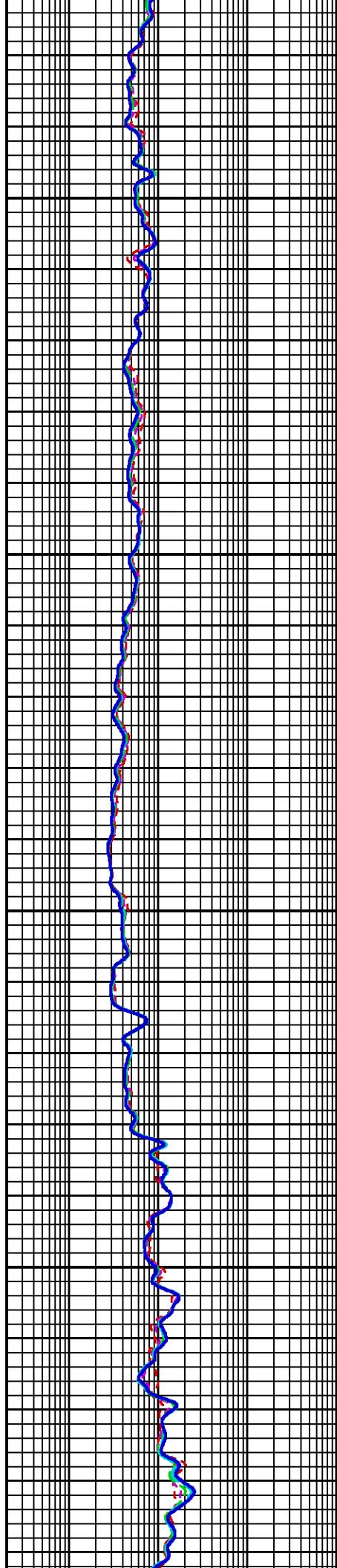




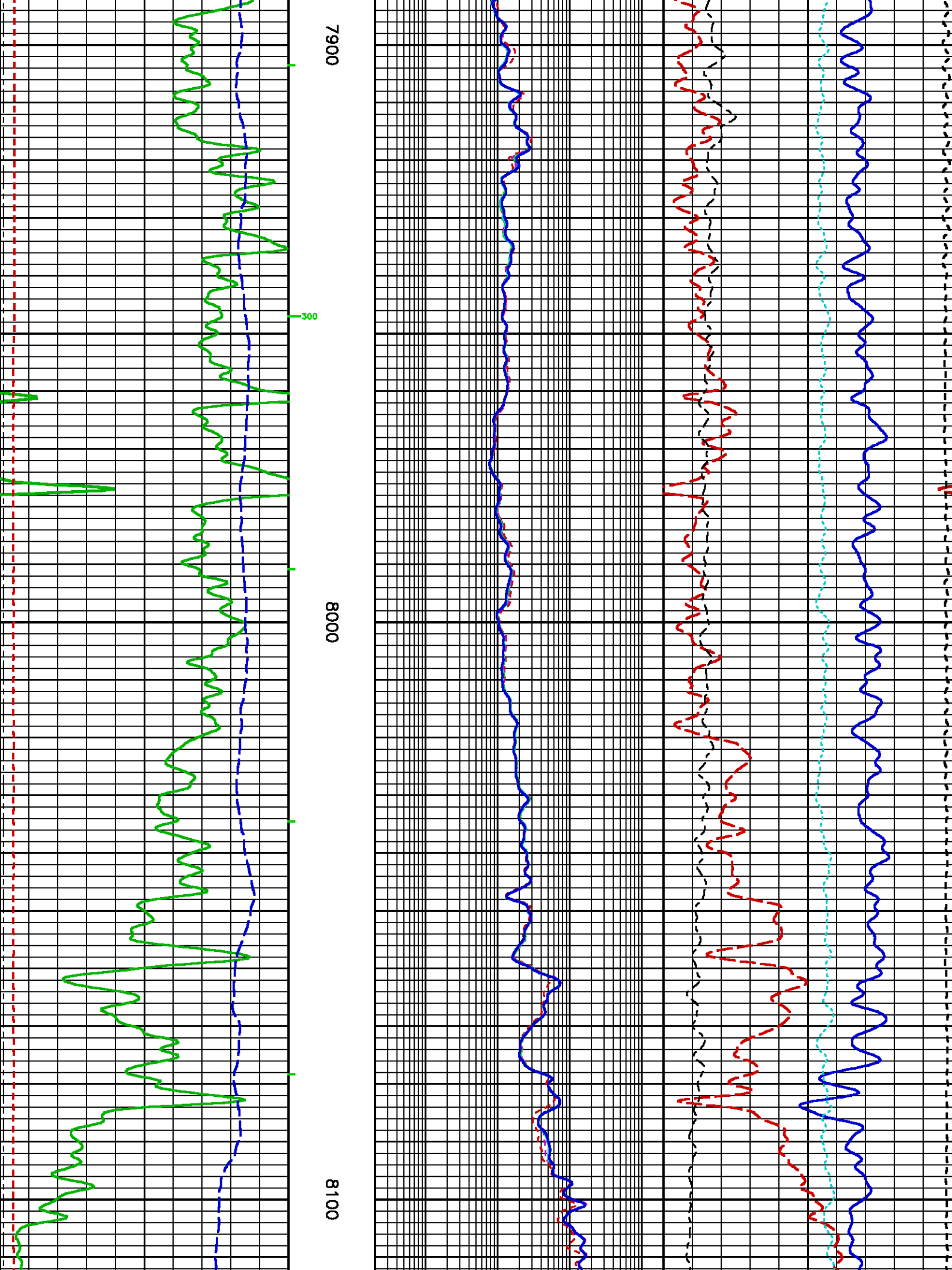


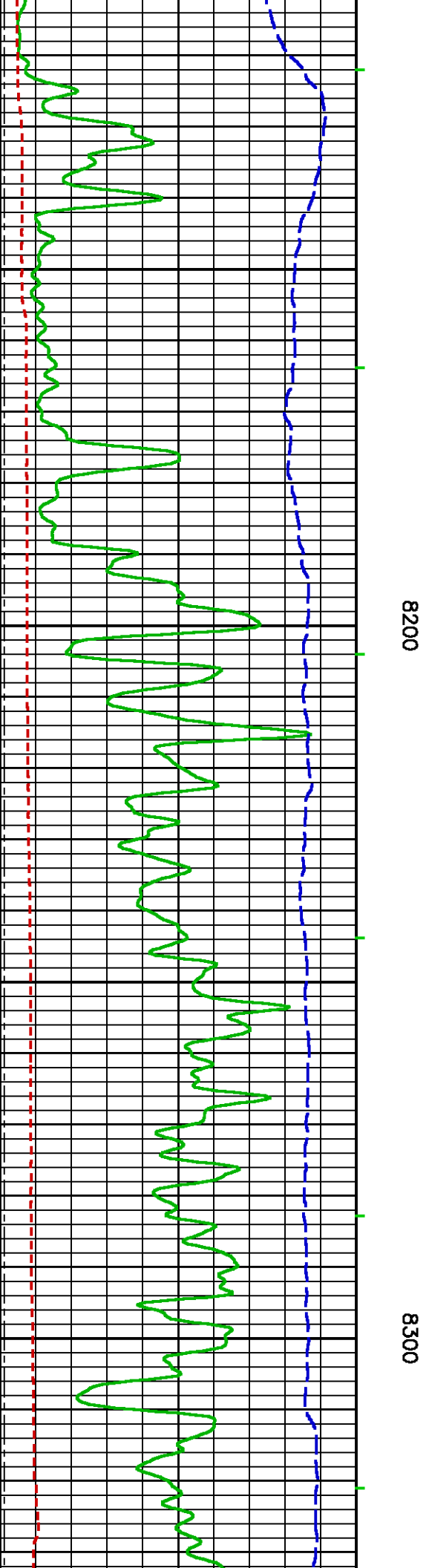
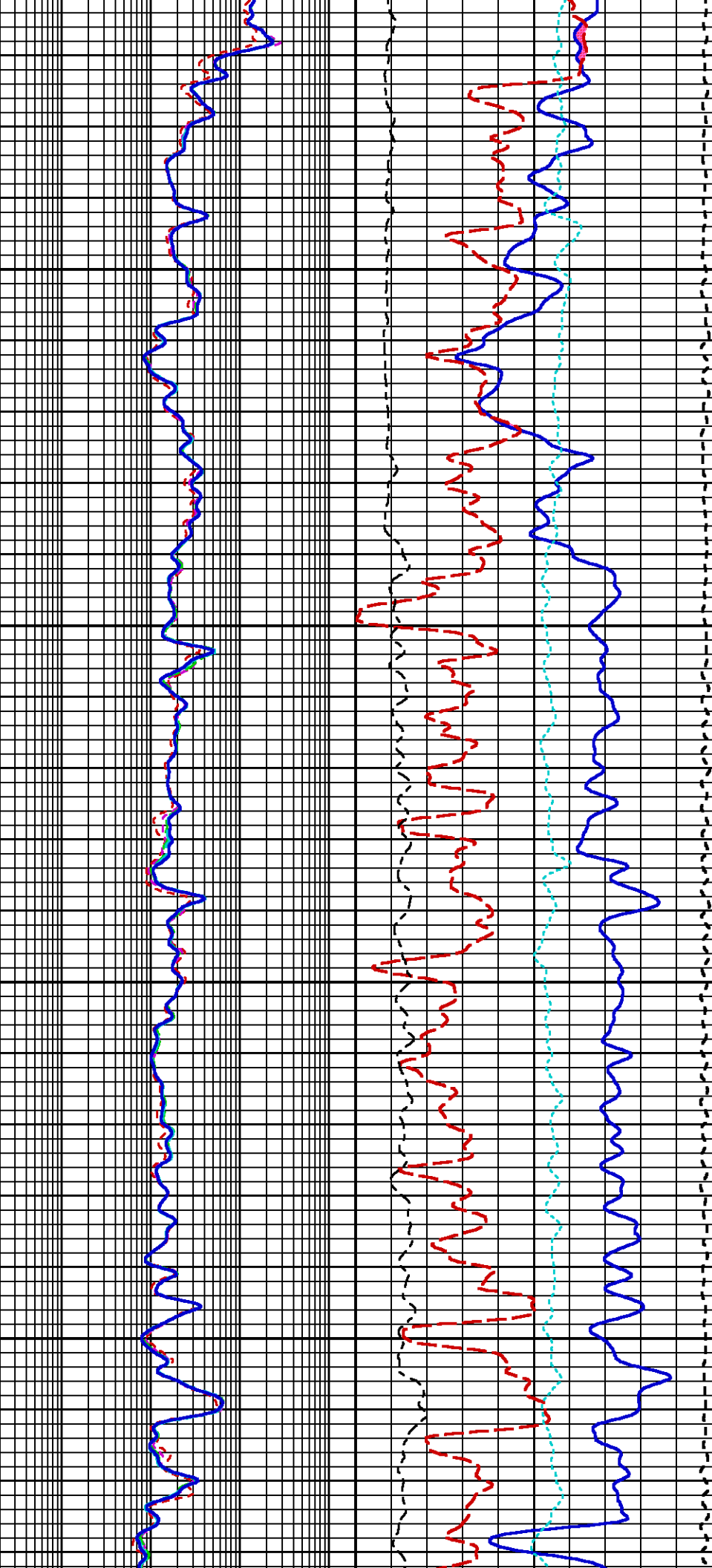
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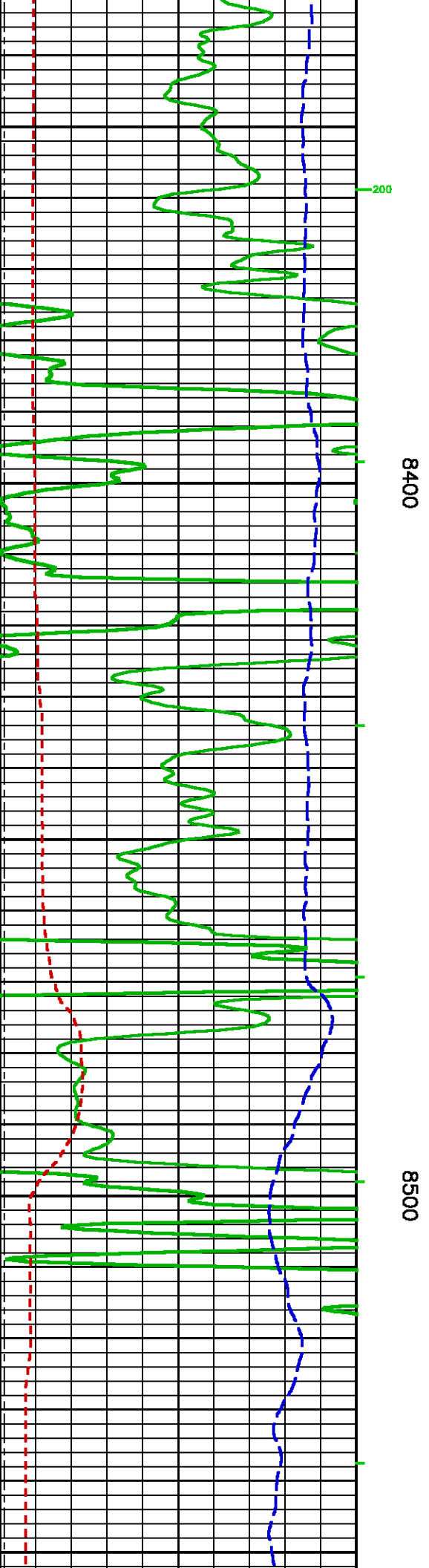
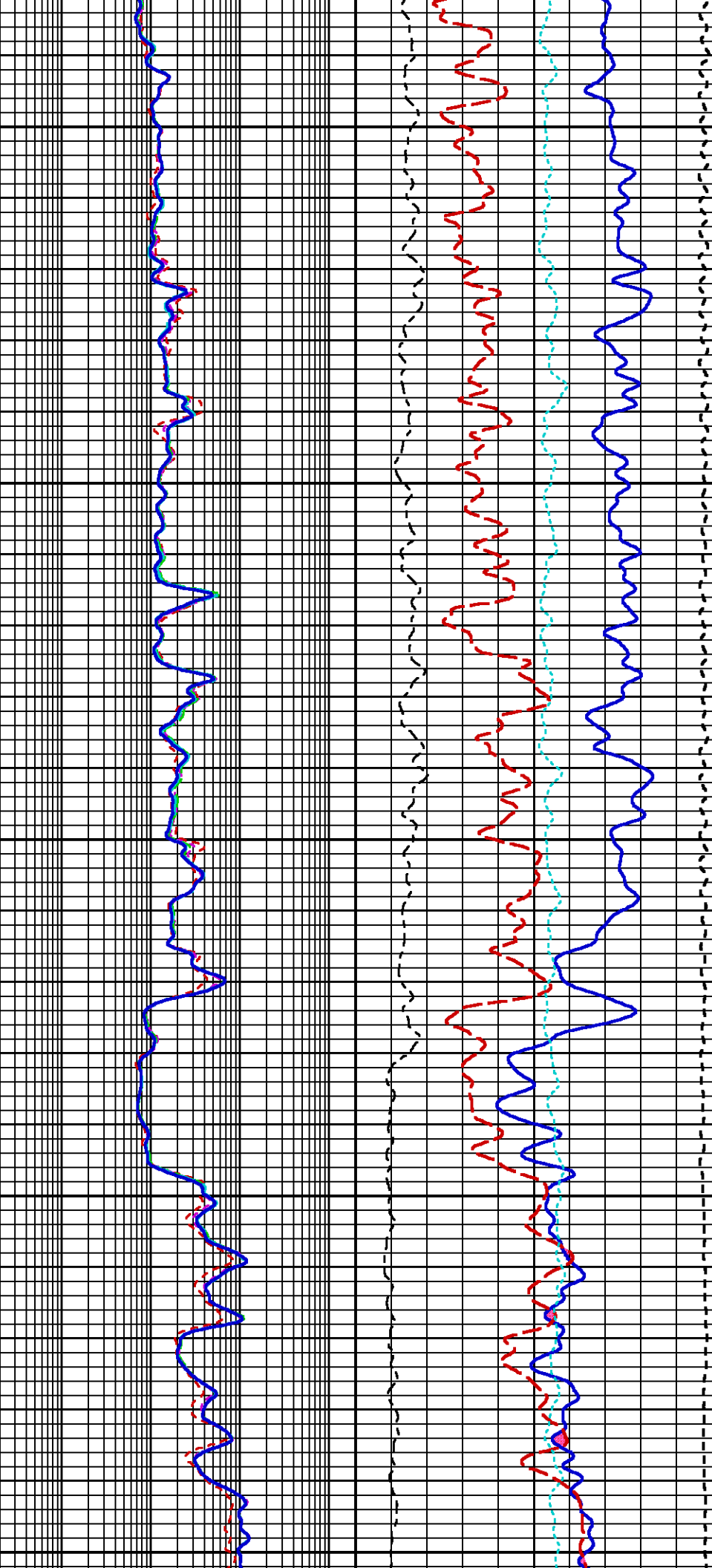
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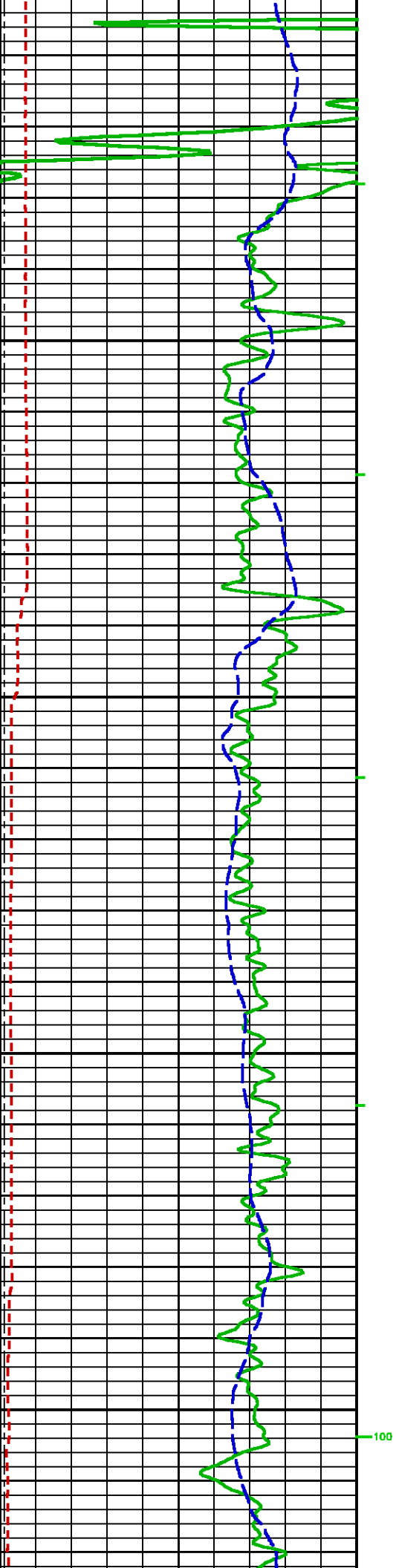






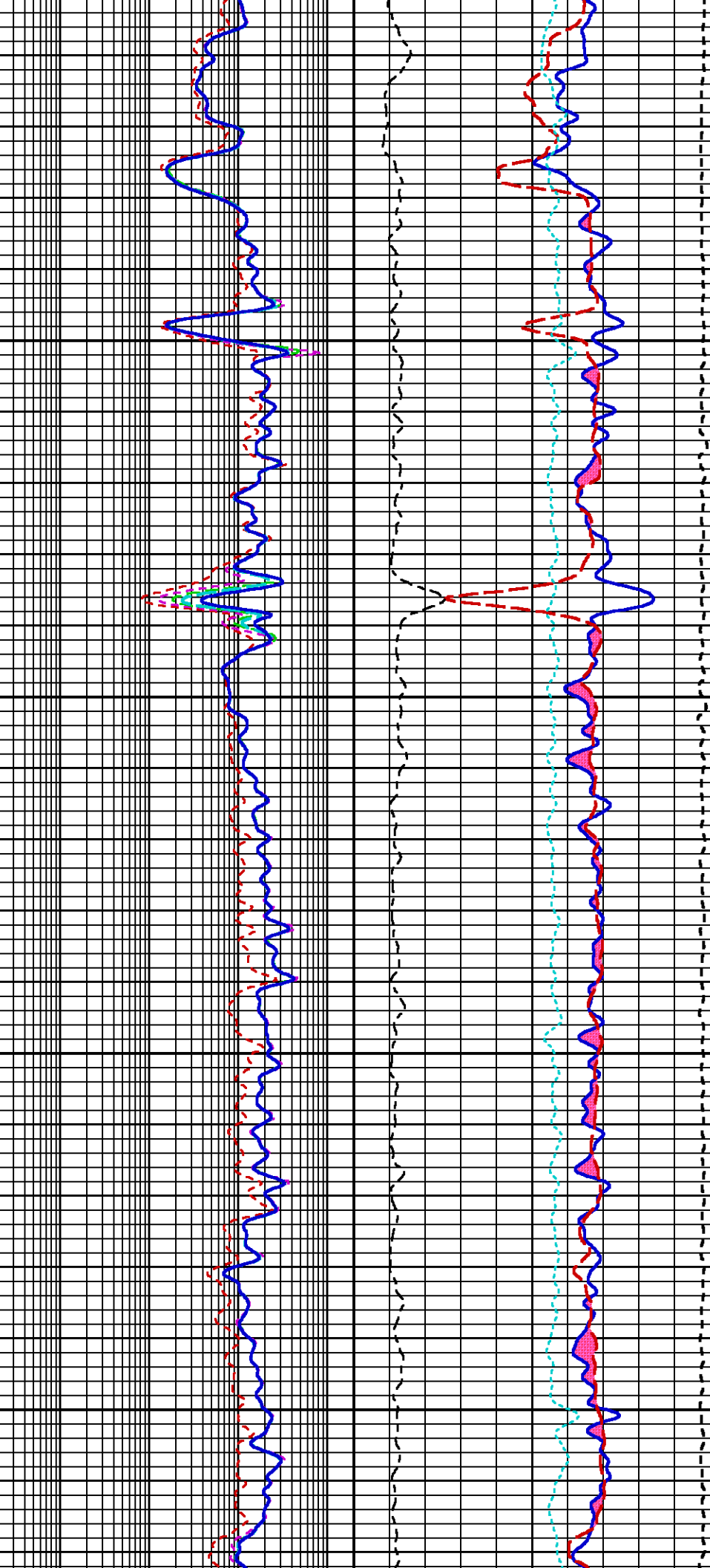


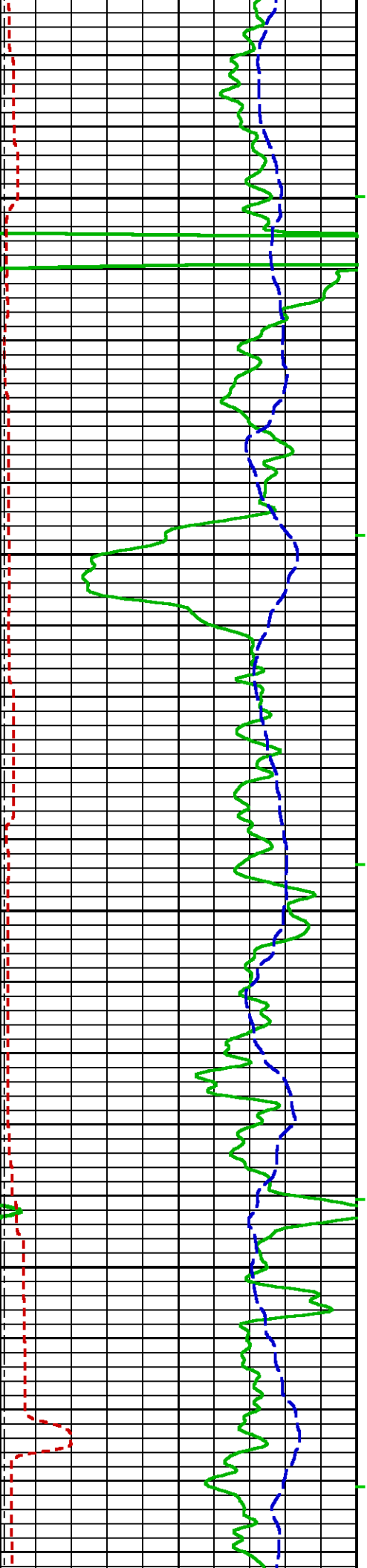




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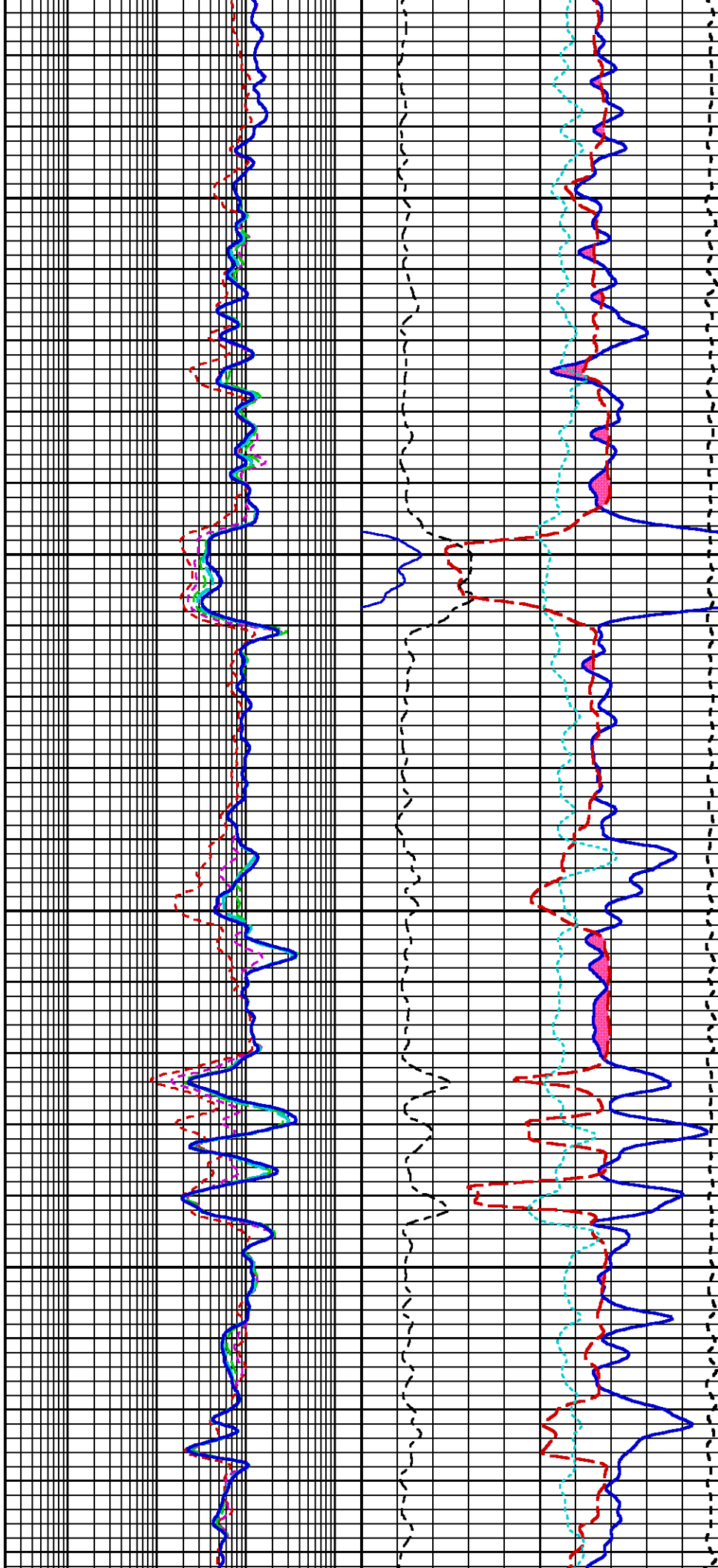
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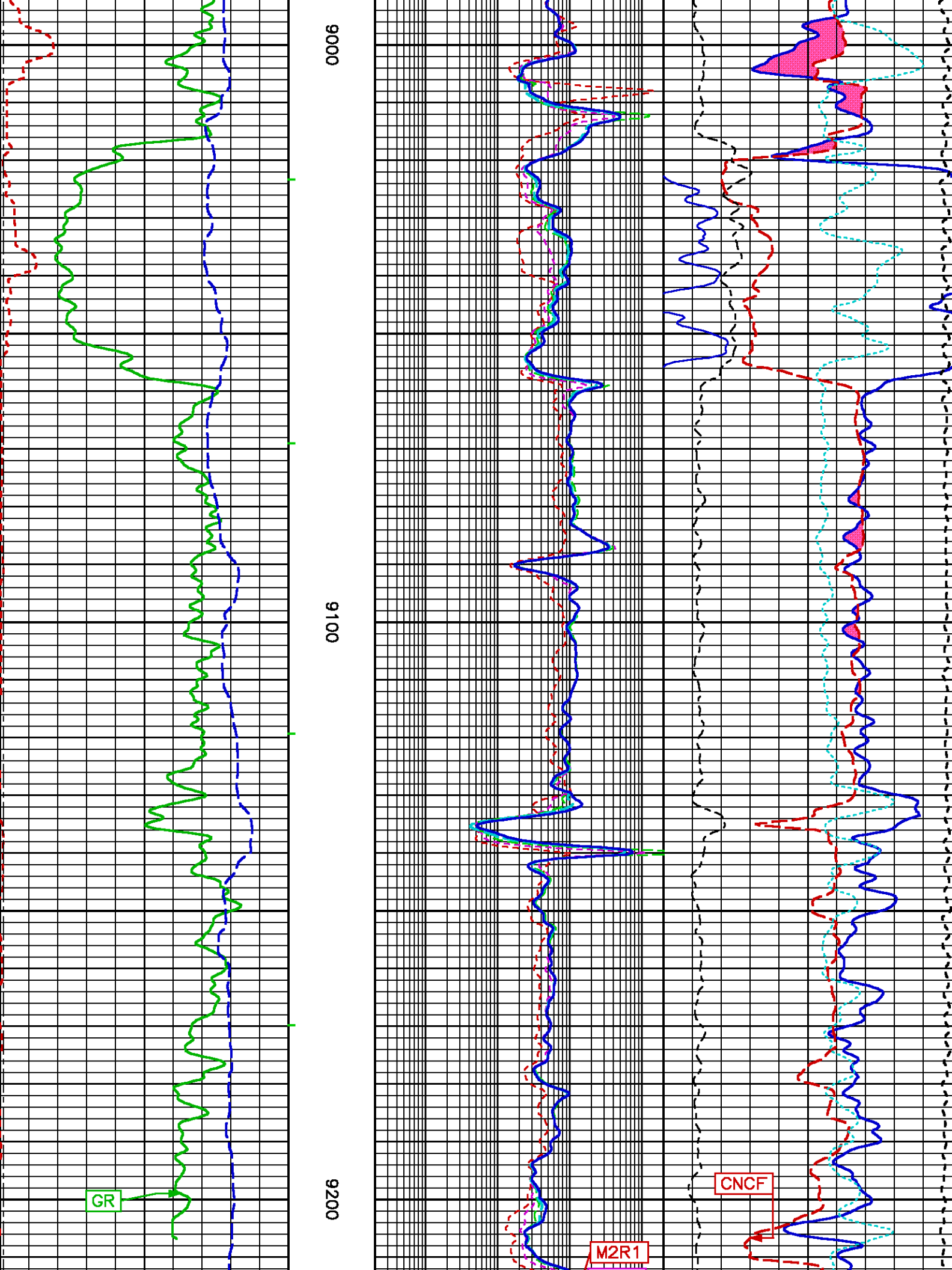


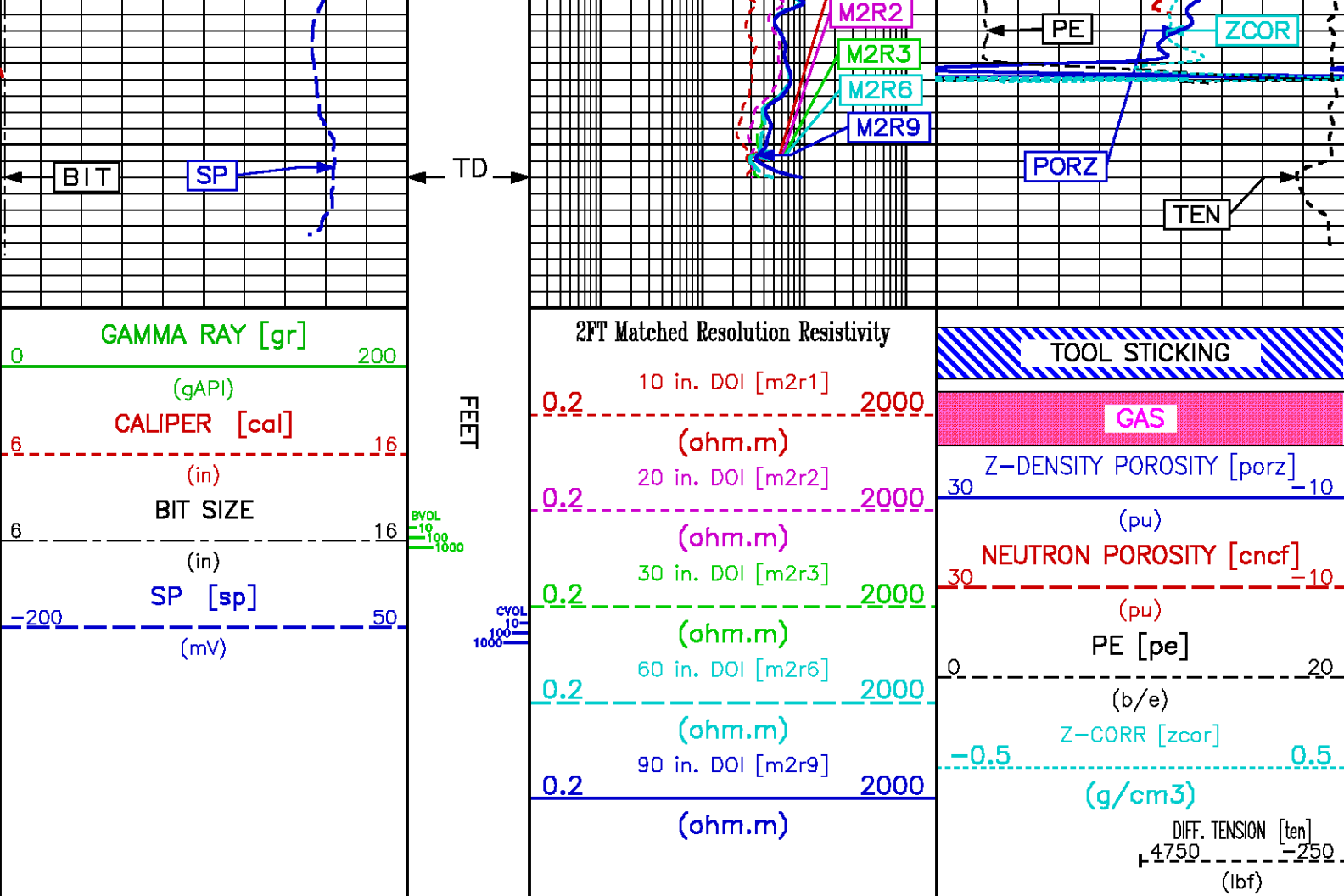


0088

0068







REPEAT LOG 5"/100FT SCALE

ECLIPS 6.11 Aug 06, 2010  
Updates: 1,2 Patches: 2

Thu Mar 21 10:41:19 2013

Pcrplt /main/62

Cplot

Pdf\_Cpp /main/16

Fileview 5.61

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/624381/m970a03.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 8939.750 ft BOTTOM DEPTH: 9249.203 ft

## SYMMETRIC FILTER

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

BOREHOLE & CEMENT					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	7.000	ln	TOP	BOTTOM
	CASING THICKNESS	0.000	ln	"	"
BIT SIZE	BIT SIZE	6.125	ln	"	"
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (mbh*)	USE CALIPER		"	"
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	6.125	ln	"	"
	FIXED DIAMETER (mbh*)	6.125	ln	"	"
MUD SAMPLE RESISTIVITY	MUD SAMPLE TEMP	57.0	degF	"	"
	MUD SAMPLE RES	2.800	ohm.m	"	"
BH MUD RESISTIVITY SOURCE	RMUD SOURCE (HDIL)	TOOL MEASURED		"	"
BOREHOLE TEMP from GRADIENT	Known BH REF TEMP	57.0	degF	"	"
	at BH REF DEPTH	0.0	ft	"	"
	with TEMP GRADIENT	1.200	0.01 degF/ft	"	"

ACCELERATION PROCESSING					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
ACCEL CORR SWITCH	ACCEL DEPTH CORR	CORRECTION ON		TOP	BOTTOM

CN PROCESSING					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CN MATRIX	2436 MATRIX	SANDSTONE		TOP	BOTTOM
CN BOREHOLE CORRECTION	SALINITY	700	ppm	"	"
	BOREHOLE CORRECTION	ON		"	"
CN CASING & CEMENT CORRECTION	CORRECTION	OFF		"	"
	BIT SIZE BEHIND CSNG	8.750	ln	"	"

ZDL PROCESSING					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
DENSITY POROSITY	Air Filled Borehole	NO		TOP	BOTTOM
	RHOmatrix	2.680	g/cm3	"	"
	RHOfluid	1.000	g/cm3	"	"

HDIL PROCESSING					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
HDIL TEMPERATURE CORRECTION	TEMP CORRECTION	ON		TOP	BOTTOM
ADAPTIVE BOREHOLE CORRECTION	ABC PROCESSING	ON		"	"
	ABC to CALCULATE	STANDOFF		"	"
	STANDOFF	1.50	ln	"	"
	TOOL POSITION	ECCENTERED		"	"
	Rmud MULTIPLIER	1.000		"	"

CURVE DESCRIPTION REPORT		
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BIT	Mar 21 10:18:40 2013	BIT SIZE
F1:BVOL	Mar 21 10:18:40 2013	BOREHOLE VOLUME
F1:CAL	Mar 21 10:18:40 2013	CALIPER
F1:CNCf	Mar 21 10:18:40 2013	FIELD NORMALIZED COMPENSATED NEUTRON POROSITY
F1:CVOL	Mar 21 10:18:40 2013	CEMENT VOLUME
F1:GR	Mar 21 10:18:40 2013	GAMMA RAY
F1:M2R1	Mar 21 10:18:40 2013	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 10-INCH DOI
F1:M2R2	Mar 21 10:18:40 2013	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 20-INCH DOI
F1:M2R3	Mar 21 10:18:40 2013	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 30-INCH DOI
F1:M2R6	Mar 21 10:18:40 2013	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 60-INCH DOI
F1:M2R9	Mar 21 10:18:40 2013	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 90-INCH DOI
F1:PE	Mar 21 10:18:40 2013	PHOTO ELECTRIC CROSS-SECTION
F1:PORZ	Mar 21 10:18:40 2013	POROSITY FOR SELECTABLE MATRIX
F1:SP	Mar 21 10:18:40 2013	SPONTANEOUS POTENTIAL
F1:TEN	Mar 21 10:18:40 2013	DIFFERENTIAL TENSION
F1:ZCOR	Mar 21 10:18:40 2013	DENSITY CORRECTION

CURVE MEASURE POINT OFFSET						
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE



BIT	0.00	M2R1	2.75	M2R9	2.75	TEN	0.00
CAL	18.12	M2R2	2.75	PE	18.00	ZCOR	18.00
CNCF	27.38	M2R3	2.75	PORZ	18.00		
GR	35.00	M2R6	2.75	SP	1.25		

Presentation
: rks6685:/dat1a/624381/HDILZDLCNGR\_REPEAT.pdf [5"/100' Scale]

Plot Interval
: 9050 - 9250 Feet

Data File 1
: F1 : rks6685:/dat1a/624381/m970a03-REPEAT.xtf

Created On
: Mar 21 10:18:40 2013

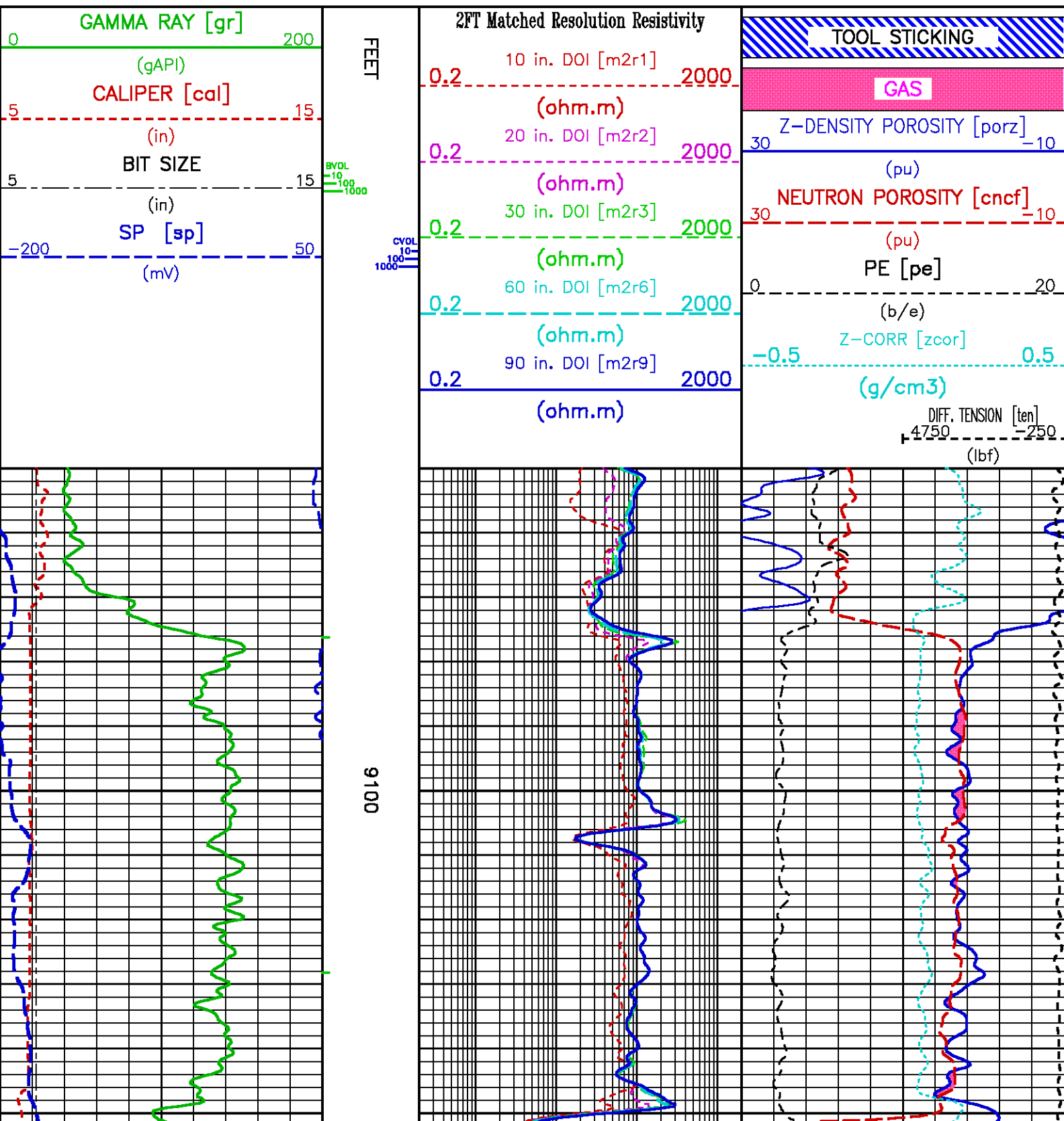
Company
: FIRST LIBERTY ENERGY INC

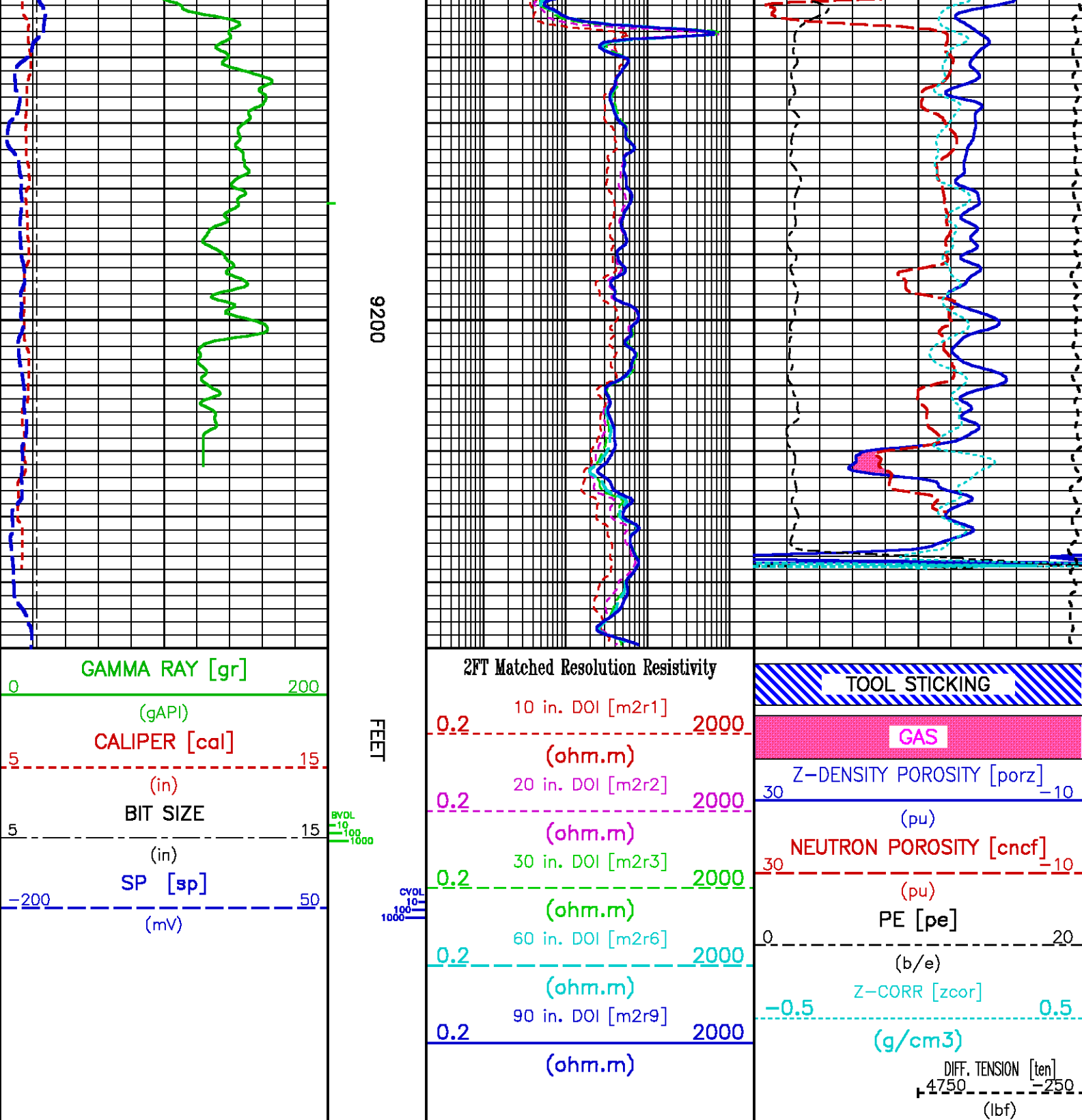
Well
: BASIN #1

Field
: DEL NORTE

File Interval
: 8914 - 9265 Feet

Oct
: m970a





### CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/824381/m970a.tp1

### TTMA PRIMARY CALIBRATION SUMMARY

TOOL #: 3980XA 10120299

DATE/TIME PERFORMED: Tue Feb 21 22:39:36 2012

UNIT #: 3882TD HL6670

ACCEL #: 3980XA 10120299

ACCEL CAL DATE: 14:43 05/21/2004

GAIN

OFFSET

RM K FACTORS

0.14570

(ohm.m)

-0.01879

## TTMA BEFORE LOG VERIFICATION SUMMARY

TOOL #: 3980XA 10120299 DATE/TIME PERFORMED: Thu Mar 21 09:02:47 2013 DAYS SINCE CAL: 393

UNIT #: 3885TC HL6685

	CHT (lbf)	MUD TEMP (degF)	RES M Q (ohm)	ACCEL Q
CAL	18815	497.82	9.97	998.48
	18030 19630	491.38 505.78	8.00 12.00	980.00 1020.00
ZERO	-23331	-436.02	0.249	997.014
	-24131 -22531	-443.20 -428.80	0.200 0.300	980.000 1020.000

## TTMA AFTER LOG VERIFICATION SUMMARY

TOOL #: 3980XA 10120299 DATE/TIME PERFORMED: Thu Mar 21 11:58:59 2013 DAYS SINCE CAL: 393

UNIT #: 3885TC HL6685

	CHT (lbf)	MUD TEMP (degF)	RES M Q (ohm)	ACCEL Q
CAL	18838	500.44	9.95	998.92
	18030 19630	491.38 505.78	8.00 12.00	980.00 1020.00
ZERO	-23331	-436.02	0.250	999.296
	-24131 -22531	-443.20 -428.80	0.200 0.300	980.000 1020.000

## GR PRIMARY CALIBRATION SUMMARY

Tool #: 3518EG 10139870

DATE/TIME PERFORMED: Tue Mar 5 13:58:57 2013

Unit #: 3885TC HL6685

Jig Series: 4702NK VBA-905

Background	Calibrator ON	Jig Value (gAPI)	Mult	Background (gAPI)	Calibrator ON (gAPI)
151.73	918.57	185	0.241	36.61	221.61
			0.230 0.260		

## GR BEFORE LOG VERIFICATION SUMMARY

TOOL #: 3518EG 10139870 DATE/TIME PERFORMED: Thu Mar 21 09:03:02 2013 DAYS SINCE CAL: 15

UNIT #: 3885TC HL6685 Jig: INTRNL N/A

Counts	TEMP (degF)	HV (V)
978.33	48.12	1381.74
928.00 1027.00	536.00	1237.00 1512.00

## GR AFTER LOG VERIFICATION SUMMARY

TOOL #: 3518EG 10139870 DATE/TIME PERFORMED: Thu Mar 21 11:58:01 2013 DAYS SINCE CAL: 15

UNIT #: 3885TC HL6685 Jig: INTRNL N/A

Counts	TEMP (degF)	HV (V)
978.67	150.79	1374.31
928.00 1027.00	536.00	1237.00 1512.00

## CN PRIMARY CALIBRATION SUMMARY

TOOL #: 2436XA 10137930

DATE/TIME PERFORMED: Tue Mar 19 10:53:54 2013

UNIT #: 3885TC HL6685

CALIBRATOR #: 2437XB 112674

SOURCE #: 4718XA N-0897

SSN DT CPS	LSN DT CPS	SSN/LSN	MCF	CNRATIO	CN PU
4580.75	801.21	5.71726	1.00345	5.73700	25.241
			0.95000 1.05000		

## CN BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2436XA 10137930 DATE/TIME PERFORMED: Thu Mar 21 09:03:16 2013 DAYS SINCE CAL: 1

UNIT #: 3885TC HL6685 CALIBRATOR #: INTRNL N/A

SSN	LSN	SSN/LSN	TEMP	HV	LV
DT CPS	DT CPS		(degF)	(V)	(V)
991.07	993.09	0.99797	37.7	1352.7	4.612
		0.95000 1.05000	280.4	1250.0 1450.0	4.300 5.000

### CN AFTER LOG VERIFICATION SUMMARY

TOOL #: 2436XA 10137930 DATE/TIME PERFORMED: Thu Mar 21 11:58:14 2013 DAYS SINCE CAL: 2

UNIT #: 3885TC HL6685 CALIBRATOR #: INTRNL N/A

SSN	LSN	SSN/LSN	TEMP	HV	LV
DT CPS	DT CPS		(degF)	(V)	(V)
990.73	992.74	0.99797	142.1	1388.8	4.612
		0.95000 1.05000	280.4	1250.0 1450.0	4.300 5.000

### CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 2223XA 10391895 DATE/TIME PERFORMED: Mon Mar 18 16:25:31 2013

UNIT #: 3885TC HL6685

	SIZE	VALUE	MULTIPLIER	ADD
	(In)			
SMALL RING (Arm)	7.000	1396.0		
LARGE RING (Arm)	11.000	2644.0	0.00321	2.52564
PAD CLOSED		1205.2	0.00250	-3.01300

### CAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2223XA 10391895 DATE/TIME PERFORMED: Thu Mar 21 09:07:40 2013 DAYS SINCE CAL: 2

UNIT #: 3885TC HL6685

	VALUE	MULTIPLIER	ADD	SIZE
				(In)
ARM	1169.2	0.00321	2.52564	6.3
PAD	1201.6	0.00250	-3.01300	-0.0

	ACTUAL	MEASURED
	(In)	(In)
DIAMETER (arm+pad)	6.366	6.3
		6.0 6.6

### CAL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2223XA 10391895 DATE/TIME PERFORMED: Thu Mar 21 11:57:12 2013 DAYS SINCE CAL: 2

UNIT #: 3885TC HL6685

	VALUE	MULTIPLIER	ADD	SIZE
				(In)
ARM	1340.0	0.00321	2.52564	6.6
PAD	1201.6	0.00250	-3.01300	-0.0

	ACTUAL	MEASURED
	(In)	(In)
DIAMETER (arm+pad)	6.366	6.3
		6.0 6.6

### ZDL PRIMARY CALIBRATION SUMMARY

TOOL: 2223XA 10391895 DATE/TIME PERFORMED: Mon Mar 18 16:08:45 2013

UNIT: 3885TC HL6685 CALB BLKS: 2225XA 094292F CS SRC: 4705XA 16069B PAD TYPE: PADTYP 7.5" PAD

SS CS PK	LS CS PK	SS_BKGD	LS BKGD	SS	LS	SHR	DEN	CORR	PE
(Channel)	(Channel)	(cps)	(cps)	(cps)	(cps)		(g/cm3)	(g/cm3)	(b/e)
224.2	223.3	1106.4	1591.0	30632.8	11596.4	0.772	1.679	0.000	1.900
220.0 230.0	220.0 230.0					0.720 0.890			

AL	19341.1	1322.7	2.867	-0.018
AL + SHIM	25604.1	2295.2	2.558	0.098
MG + SHIM (HI PE)	15375.3	5604.3	0.298	8.550
			0.280	0.360
RATIO AL + SHIM/AL	1.32	1.74		
	1.30	1.40	1.80	1.80
RATIO MG/AL	1.58	8.77		
	1.58	1.70	8.55	9.55

### ZDL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2223XA 10391895 DATE/TIME PERFORMED: Thu Mar 21 09:03:42 2013 DAYS SINCE CAL: 2

UNIT #: 3885TC HL6685

	TOTAL (cps)	CSPK (Channel)	HV (V)
LS	3342.1	224.9	1418.3
	3332.1 3352.1	220.0 230.0	1290.0 1550.0
SS	22354.8	224.2	1428.7
	22344.8 22364.8	220.0 230.0	1290.0 1550.0
	LV (V)	PAD CURRENT (mA)	
	5.0	86.4	
	4.8 5.2	80.0 120.0	

### ZDL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2223XA 10391895 DATE/TIME PERFORMED: Thu Mar 21 11:58:29 2013 DAYS SINCE CAL: 2

UNIT #: 3885TC HL6685

	TOTAL (cps)	CSPK (Channel)	HV (V)
LS	3342.1	224.9	1469.7
	3332.1 3352.1	220.0 230.0	1290.0 1550.0
SS	22354.8	224.2	1465.7
	22344.8 22364.8	220.0 230.0	1290.0 1550.0
	LV (V)	PAD CURRENT (mA)	
	5.0	91.7	
	4.8 5.2	80.0 120.0	

### HDIL PRIMARY CALIBRATION SUMMARY

TOOL #: 1530XA 10103013 DATE/TIME PERFORMED: Thu Jan 3 16:04:16 2013

UNIT #: 3880TA HL6670 ORCOND ID & DATE: 37 101801

ZERO DATA(mv)	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 R	-0.0014	-0.0013	0.0005	-0.0004	-0.0008	0.0001	-0.0008	0.0002
	-0.2000 0.2000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000
Coil 0 Q	-0.0087	-0.0013	0.0005	0.0003	-0.0004	0.0001	-0.0009	0.0001
	-0.5000 0.5000	-0.2000 0.2000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000
Coil 1 R	-0.0045	0.0028	0.0002	0.0015	0.0001	0.0013	0.0015	-0.0003
	-0.2000 0.2000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000
Coil 1 Q	-0.0186	-0.0004	0.0000	-0.0000	0.0008	0.0008	0.0011	0.0009
	-0.5000 0.5000	-0.2000 0.2000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000
Coil 2 R	-0.0045	-0.0000	-0.0008	-0.0029	0.0035	0.0024	-0.0030	-0.0008
	-0.2000 0.2000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000
Coil 2 Q	-0.0148	0.0011	-0.0020	-0.0044	0.0008	0.0017	-0.0009	-0.0024
	-0.5000 0.5000	-0.2000 0.2000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000
Coil 3 R	0.0168	-0.0058	-0.0020	0.0038	-0.0086	0.0031	0.0011	0.0036
	-0.3000 0.3000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000
Coil 3 Q	-0.0197	-0.0034	-0.0044	-0.0012	-0.0003	0.0012	0.0003	0.0018
	-0.5000 0.5000	-0.2000 0.2000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000	-0.1000 0.1000
Coil 4 R	-0.0157	0.0057	0.0008	-0.0089	-0.0010	-0.0028	-0.0004	0.0049
	-0.5000 0.5000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000
Coil 4 Q	-0.0132	0.0139	-0.0104	-0.0028	-0.0088	-0.0058	0.0018	-0.0089
	-1.0000 1.0000	-0.4000 0.4000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000	-0.2000 0.2000
Coil 5 R	0.0136	-0.0169	-0.0033	0.0362	0.0084	0.0081	-0.0029	-0.0008
	-1.2000 1.2000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000
Coil 5 Q	-0.0822	-0.0078	0.0028	-0.0208	-0.0104	0.0149	0.0088	0.0022
	-1.5000 1.5000	-0.8000 0.8000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000	-0.4000 0.4000

ELEC. GAINS	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	160.81	159.30	156.28	151.83	145.97	138.85	130.49	121.00
	136.00 186.00	134.00 184.00	131.00 181.00	128.00 176.00	122.00 170.00	118.00 181.00	112.00 190.00	105.00 199.00
Coil 0 P	7.842	25.879	43.081	60.436	77.774	95.104	112.418	129.726
	6.000 9.000	21.000 30.000	35.000 50.000	49.000 71.000	63.000 91.000	77.000 109.000	92.000 130.000	106.000 151.000
Coil 1 M	291.96	288.92	282.88	274.12	262.74	249.25	233.63	216.37
	236.00 328.00	236.00 328.00	230.00 320.00	225.00 312.00	218.00 302.00	208.00 288.00	196.00 268.00	184.00 244.00

Coil 1 P	7.914 6.000 8.000	25.935 21.000 30.000	43.478 35.000 51.000	60.922 49.000 71.000	78.296 63.000 92.000	95.579 78.000 112.000	112.810 93.000 130.000	129.957 107.000 151.000
Coil 2 M	575.55 476.00 656.00	570.28 474.00 654.00	559.47 463.00 643.00	543.74 450.00 622.00	523.01 432.00 602.00	497.94 412.00 572.00	468.37 390.00 540.00	434.94 358.00 499.00
Coil 2 P	7.857 6.000 8.000	25.829 21.000 31.000	43.353 35.000 51.000	60.803 49.000 71.000	78.243 63.000 92.000	95.675 78.000 115.000	113.121 92.000 135.000	130.551 105.000 155.000
Coil 3 M	937.93 772.00 1060.00	929.80 784.00 1050.00	912.64 752.00 1030.00	887.54 728.00 1010.00	854.45 700.00 970.00	813.95 665.00 925.00	766.50 628.00 868.00	712.47 588.00 799.00
Coil 3 P	7.862 6.000 10.000	25.801 21.000 30.000	43.309 35.000 51.000	60.788 49.000 72.000	78.213 63.000 93.000	95.659 78.000 114.000	113.148 90.000 135.000	130.597 104.000 156.000
Coil 4 M	1488.7 1210.0 1700.0	1474.2 1208.0 1690.0	1444.4 1180.0 1880.0	1400.7 1140.0 1690.0	1344.1 1120.0 1630.0	1275.7 1070.0 1480.0	1197.0 1000.0 1380.0	1108.4 942.0 1240.0
Coil 4 P	7.987 6.000 10.000	26.182 21.000 31.000	43.924 35.000 52.000	61.576 49.000 73.000	79.176 63.000 93.000	96.730 77.000 114.000	114.258 91.000 135.000	131.685 105.000 156.000
Coil 5 M	3029.4 2490.0 3490.0	3002.6 2420.0 3400.0	2944.1 2410.0 3320.0	2859.4 2330.0 3200.0	2746.4 2280.0 3080.0	2612.2 2150.0 2990.0	2453.6 2020.0 2790.0	2277.7 1870.0 2970.0
Coil 5 P	8.010 6.000 10.000	26.264 20.000 31.000	44.085 35.000 52.000	61.822 49.000 73.000	79.542 63.000 94.000	97.201 78.000 113.000	114.876 93.000 134.000	132.513 106.000 156.000

AM Factor	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 R	-1187 -3200 840	-671 -1400 -20	-528 -930 -150	-447 -780 -180	-393 -860 -130	-357 -600 -120	-328 -560 -110	-305 -520 -92
Coil 0 Q	-1805 -18000 11000	-880 -8800 3800	-668 -3700 2100	-574 -2700 1400	-521 -2200 1000	-490 -1800 790	-470 -1600 620	-458 -1500 490
Coil 1 R	-264 -750 440	-190 -360 83	-159 -280 9	-139 -230 -10	-125 -200 -26	-113 -180 -35	-105 -160 -48	-97 -150 -49
Coil 1 Q	-599 -3500 3500	-280 -1100 880	-204 -630 530	-171 -470 380	-152 -380 260	-140 -320 180	-131 -280 150	-124 -260 120
Coil 2 R	-15.6 -85.0 76.0	-36.7 -84.0 -0.4	-36.5 -57.0 -12.0	-33.6 -51.0 -16.0	-30.7 -46.0 -17.0	-28.1 -42.0 -18.0	-25.2 -39.0 -15.0	-23.5 -37.0 -13.0
Coil 2 Q	-152.6 -1500.0 1900.0	-54.2 -500.0 610.0	-35.9 -290.0 360.0	-28.5 -220.0 280.0	-23.8 -160.0 190.0	-19.3 -140.0 160.0	-18.0 -110.0 130.0	-12.9 -99.0 120.0
Coil 3 R	-6.1 -25.0 21.0	-10.5 -22.0 1.6	-11.2 -21.0 -1.3	-10.3 -20.0 -1.8	-9.5 -18.0 -2.0	-8.8 -19.0 -1.3	-8.1 -18.0 -0.8	-7.6 -18.0 -0.0
Coil 3 Q	-85.8 -340.0 530.0	-25.5 -180.0 180.0	-12.7 -100.0 110.0	-5.8 -71.0 61.0	-0.9 -51.0 66.0	3.4 -37.0 58.0	6.9 -28.0 53.0	10.3 -21.0 51.0
Coil 4 R	-2.54 -18.00 13.00	-2.71 -12.00 2.70	-2.79 -11.00 1.50	-2.57 -9.80 0.52	-0.62 -9.90 0.66	-2.15 -10.00 1.50	-1.52 -11.00 2.30	-1.93 -11.00 2.60
Coil 4 Q	-11.54 -250.00 280.00	-1.77 -79.00 88.00	1.17 -43.00 84.00	3.65 -27.00 51.00	7.56 -18.00 48.00	7.24 -11.00 42.00	8.86 -5.50 42.00	11.08 -1.00 42.00
Coil 5 R	-0.57 -56.00 51.00	-0.27 -8.40 3.60	-0.62 -6.90 1.10	-0.24 -8.90 1.20	-1.13 -9.30 2.90	-0.78 -14.00 6.30	-0.34 -19.00 9.80	-0.35 -24.00 13.00
Coil 5 Q	-3.74 -58.00 69.00	-0.47 -26.00 27.00	1.44 -14.00 22.00	2.83 -7.00 22.00	5.63 -2.50 24.00	5.82 1.10 26.00	6.26 4.10 29.00	8.20 7.10 82.00

MM Factor	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	0.975 0.850 1.100	0.983 0.880 1.100	0.988 0.870 1.100	0.989 0.880 1.100	0.990 0.880 1.100	0.991 0.880 1.100	0.991 0.880 1.100	0.990 0.880 1.100
Coil 0 P	-0.343 -1.500 1.500	-0.495 -1.500 1.500	-0.387 -1.500 1.500	-0.252 -1.500 1.500	-0.173 -1.500 1.500	-0.094 -1.500 1.500	-0.071 -1.500 1.500	-0.001 -1.500 1.500
Coil 1 M	0.971 0.850 1.100	0.980 0.880 1.100	0.985 0.870 1.100	0.987 0.880 1.100	0.987 0.880 1.100	0.987 0.880 1.100	0.987 0.880 1.100	0.986 0.880 1.100
Coil 1 P	-0.333 -1.600 1.600	-0.495 -1.800 1.800	-0.372 -1.600 1.600	-0.247 -1.600 1.600	-0.132 -1.500 1.600	-0.075 -1.600 1.600	-0.033 -1.800 1.800	0.005 -1.800 1.600
Coil 2 M	0.996 0.890 1.100	0.996 0.890 1.100	0.996 0.890 1.100	0.996 0.890 1.100	0.996 0.890 1.100	0.996 0.890 1.100	0.995 0.890 1.100	0.994 0.890 1.100
Coil 2 P	0.014 -1.500 1.500	0.027 -1.500 1.500	0.072 -1.500 1.500	0.100 -1.500 1.500	0.120 -1.500 1.500	0.137 -1.500 1.500	0.150 -1.500 1.500	0.157 -1.500 1.500
Coil 3 M	1.003 0.800 1.100	1.004 0.900 1.100	1.004 0.900 1.100	1.004 0.800 1.100	1.003 0.900 1.100	1.003 0.900 1.100	1.002 0.800 1.100	1.001 0.800 1.100
Coil 3 P	0.057 -1.500 1.500	0.076 -1.500 1.500	0.128 -1.500 1.500	0.176 -1.500 1.500	0.217 -1.500 1.500	0.254 -1.500 1.500	0.312 -1.500 1.500	0.333 -1.500 1.500
Coil 4 M	1.007 0.900 1.100	1.008 0.900 1.100	1.008 0.900 1.100	1.008 0.900 1.100	1.009 0.900 1.100	1.009 0.900 1.100	1.009 0.900 1.100	1.009 0.900 1.100
Coil 4 P	-0.148 -1.600 1.600	0.011 -1.800 1.800	0.129 -1.600 1.600	0.209 -1.800 1.600	0.369 -1.600 1.600	0.395 -1.800 1.600	0.482 -1.800 1.600	0.539 -1.800 1.600
Coil 5 M	1.030 0.800 1.100	1.030 0.900 1.100	1.031 0.900 1.100	1.032 0.900 1.100	1.030 0.800 1.100	1.036 0.900 1.100	1.038 0.900 1.100	1.040 0.900 1.100
Coil 5 P	-0.493 -1.500 1.500	-0.048 -1.500 1.500	0.148 -1.500 1.500	0.294 -1.500 1.500	0.480 -1.500 1.500	0.688 -1.500 1.500	0.787 -1.500 1.500	0.870 -1.500 1.500

PARMS TCID 0 TCID 1 Cal Temp (degF) T Factor  
 ID# 2.874 0.940 35.7 1.00

## HDIL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1530XA 10103013 DATE/TIME PERFORMED: Thu Mar 21 09:04:47 2013 DAYS SINCE CAL: 78

UNIT #: 3885TC HL6685

ZERO DATA(mv)	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 R	-0.002 -0.200 0.200	0.000 -0.100 0.100	-0.000 -0.100 0.100	0.000 -0.100 0.100	-0.000 -0.100 0.100	-0.000 -0.100 0.100	-0.000 -0.100 0.100	0.001 -0.100 0.100
Coil 0 Q	-0.008 -0.800 0.800	-0.001 -0.200 0.200	-0.001 -0.100 0.100	-0.001 -0.100 0.100	0.001 -0.100 0.100	-0.000 -0.100 0.100	-0.000 -0.100 0.100	0.000 -0.100 0.100
Coil 1 R	-0.004 -0.200 0.200	-0.001 -0.100 0.100	-0.003 -0.100 0.100	0.002 -0.100 0.100	0.001 -0.100 0.100	0.000 -0.100 0.100	0.000 -0.100 0.100	0.002 -0.100 0.100

Coil 1 Q	-0.018 -0.500 0.500	0.002 -0.200 0.200	-0.001 -0.100 0.100	0.001 -0.100 0.100	-0.000 -0.100 0.100	0.001 -0.100 0.100	-0.000 -0.100 0.100	0.001 -0.100 0.100
Coil 2 R	0.000 -0.200 0.200	-0.001 -0.100 0.100	-0.002 -0.100 0.100	0.001 -0.100 0.100	0.002 -0.100 0.100	0.002 -0.100 0.100	0.002 -0.100 0.100	0.002 -0.100 0.100
Coil 2 Q	-0.018 -0.500 0.500	0.001 -0.200 0.200	0.000 -0.100 0.100	0.004 -0.100 0.100	0.000 -0.100 0.100	-0.001 -0.100 0.100	-0.001 -0.100 0.100	0.001 -0.100 0.100
Coil 3 R	0.015 -0.300 0.300	0.001 -0.100 0.100	-0.008 -0.100 0.100	-0.007 -0.100 0.100	-0.001 -0.100 0.100	0.004 -0.100 0.100	-0.007 -0.100 0.100	0.005 -0.100 0.100
Coil 3 Q	-0.020 -0.500 0.500	-0.001 -0.200 0.200	-0.001 -0.100 0.100	-0.007 -0.100 0.100	-0.000 -0.100 0.100	0.008 -0.100 0.100	0.002 -0.100 0.100	0.000 -0.100 0.100
Coil 4 R	-0.030 -0.500 0.500	0.013 -0.200 0.200	-0.004 -0.200 0.200	-0.001 -0.200 0.200	-0.001 -0.200 0.200	0.004 -0.200 0.200	-0.005 -0.200 0.200	0.003 -0.200 0.200
Coil 4 Q	-0.027 -1.000 1.000	0.011 -0.400 0.400	0.005 -0.200 0.200	-0.009 -0.200 0.200	-0.002 -0.200 0.200	-0.005 -0.200 0.200	-0.005 -0.200 0.200	-0.004 -0.200 0.200
Coil 5 R	0.001 -1.200 1.200	0.017 -0.400 0.400	-0.001 -0.400 0.400	-0.011 -0.400 0.400	-0.007 -0.400 0.400	-0.031 -0.400 0.400	-0.007 -0.400 0.400	-0.008 -0.400 0.400
Coil 5 Q	-0.018 -1.800 1.800	-0.013 -0.800 0.800	0.002 -0.400 0.400	0.004 -0.400 0.400	-0.011 -0.400 0.400	-0.003 -0.400 0.400	-0.001 -0.400 0.400	-0.007 -0.400 0.400

ELEC. GAINS	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	160.61 136.00 186.00	159.10 134.00 184.00	156.05 131.00 181.00	151.59 126.00 176.00	145.72 122.00 170.00	138.57 118.00 161.00	130.21 112.00 150.00	120.75 105.00 159.00
Coil 0 P	7.899 -1.000 12.000	25.716 19.000 30.000	43.127 35.000 50.000	60.483 49.000 71.000	77.827 63.000 91.000	95.165 77.000 110.000	112.497 92.000 130.000	129.786 105.000 151.000
Coil 1 M	291.86 237.00 327.00	288.81 235.00 325.00	282.74 230.00 320.00	273.93 225.00 312.00	262.58 216.00 302.00	248.98 208.00 288.00	233.37 196.00 266.00	216.12 184.00 244.00
Coil 1 P	7.970 -1.000 12.000	25.969 19.000 30.000	43.521 35.000 51.000	60.966 49.000 71.000	78.343 63.000 92.000	95.641 77.000 112.000	112.887 92.000 132.000	130.023 105.000 153.000
Coil 2 M	574.95 478.00 659.00	569.61 474.00 654.00	558.84 463.00 643.00	543.02 450.00 622.00	522.36 432.00 602.00	497.00 412.00 572.00	467.57 390.00 540.00	434.11 358.00 489.00
Coil 2 P	7.921 -1.000 12.000	25.865 19.000 31.000	43.387 35.000 51.000	60.853 49.000 71.000	78.299 63.000 92.000	95.743 77.000 114.000	113.203 92.000 135.000	130.605 105.000 156.000
Coil 3 M	937.27 772.00 1060.00	928.88 764.00 1050.00	911.82 752.00 1030.00	886.62 728.00 1010.00	853.57 700.00 970.00	812.99 665.00 925.00	765.30 628.00 868.00	711.08 589.00 789.00
Coil 3 P	7.922 -2.000 13.000	25.839 19.000 31.000	43.351 35.000 52.000	60.808 49.000 72.000	78.267 63.000 93.000	95.730 77.000 114.000	113.199 92.000 135.000	130.678 105.000 156.000
Coil 4 M	1467.6 1210.0 1700.0	1473.0 1208.0 1690.0	1443.3 1180.0 1660.0	1399.5 1140.0 1690.0	1342.7 1120.0 1630.0	1273.9 1070.0 1460.0	1195.0 1000.0 1360.0	1108.4 942.0 1240.0
Coil 4 P	8.056 -2.000 13.000	26.224 19.000 31.000	43.968 35.000 52.000	61.624 49.000 73.000	79.241 63.000 93.000	96.766 78.000 114.000	114.312 92.000 135.000	131.750 105.000 156.000
Coil 5 M	3027.0 2450.0 3450.0	2999.9 2420.0 3400.0	2941.1 2410.0 3320.0	2854.2 2350.0 3200.0	2743.9 2280.0 3080.0	2606.5 2150.0 2950.0	2451.0 2020.0 2750.0	2273.5 1870.0 2570.0
Coil 5 P	8.068 -2.000 13.000	26.305 19.000 31.000	44.133 35.000 52.000	61.892 49.000 73.000	79.592 63.000 94.000	97.298 78.000 114.000	114.947 93.000 135.000	132.620 106.000 156.000

## HDIL AFTER LOG VERIFICATION SUMMARY

TOOL #: 1530XA 10103013 DATE/TIME PERFORMED: Thu Mar 21 11:58:32 2013 DAYS SINCE CAL: 78

UNIT #: 3885TC HL6885

ZERO DATA(mv)	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 R	-0.003 -0.082 0.078	-0.001 -0.060 0.060	0.001 -0.030 0.030	0.001 -0.030 0.030	0.000 -0.030 0.030	-0.001 -0.030 0.030	0.000 -0.030 0.030	0.000 -0.029 0.031
Coil 0 Q	-0.010 -0.048 0.032	0.001 -0.121 0.118	-0.001 -0.031 0.029	-0.000 -0.031 0.029	-0.000 -0.029 0.031	0.000 -0.030 0.030	0.001 -0.030 0.030	0.001 -0.030 0.030
Coil 1 R	0.003 -0.084 0.078	0.002 -0.051 0.048	0.001 -0.033 0.027	-0.001 -0.028 0.032	-0.002 -0.029 0.031	-0.002 -0.030 0.030	0.002 -0.030 0.030	0.001 -0.028 0.032
Coil 1 Q	-0.006 -0.418 0.382	-0.000 -0.088 0.102	0.000 -0.031 0.029	-0.001 -0.029 0.031	-0.000 -0.030 0.030	-0.000 -0.029 0.031	0.001 -0.030 0.030	-0.001 -0.029 0.031
Coil 2 R	-0.001 -0.070 0.070	-0.005 -0.031 0.028	0.003 -0.032 0.028	-0.003 -0.028 0.031	-0.000 -0.028 0.032	0.001 -0.028 0.032	-0.000 -0.028 0.032	0.003 -0.028 0.032
Coil 2 Q	-0.008 -0.388 0.332	-0.001 -0.099 0.101	-0.005 -0.030 0.030	-0.001 -0.026 0.034	0.004 -0.030 0.030	0.000 -0.031 0.029	0.001 -0.031 0.028	-0.003 -0.029 0.031
Coil 3 R	0.016 -0.025 0.065	-0.004 -0.039 0.041	0.005 -0.046 0.034	-0.003 -0.047 0.035	-0.002 -0.041 0.039	-0.009 -0.036 0.044	-0.001 -0.047 0.033	0.002 -0.035 0.045
Coil 3 Q	-0.022 -0.220 0.180	-0.009 -0.081 0.079	0.005 -0.041 0.039	-0.006 -0.047 0.035	-0.002 -0.040 0.040	-0.002 -0.034 0.048	0.004 -0.038 0.042	-0.002 -0.040 0.040
Coil 4 R	-0.014 -0.090 0.030	0.008 -0.047 0.073	-0.008 -0.064 0.056	-0.000 -0.061 0.059	0.017 -0.061 0.059	-0.008 -0.056 0.064	0.003 -0.063 0.055	0.008 -0.057 0.063
Coil 4 Q	-0.018 -0.327 0.273	0.009 -0.089 0.111	-0.003 -0.035 0.065	0.007 -0.069 0.051	-0.003 -0.062 0.058	0.003 -0.065 0.055	0.000 -0.063 0.055	-0.002 -0.064 0.056
Coil 5 R	0.087 -0.119 0.121	0.003 -0.103 0.137	-0.002 -0.121 0.119	-0.008 -0.131 0.109	-0.009 -0.127 0.113	-0.010 -0.151 0.089	0.008 -0.127 0.113	-0.002 -0.128 0.112
Coil 5 Q	0.025 -0.516 0.584	0.003 -0.263 0.257	0.008 -0.118 0.122	0.036 -0.115 0.124	-0.013 -0.131 0.109	-0.008 -0.123 0.117	-0.009 -0.121 0.118	-0.005 -0.127 0.113

ELEC. GAINS	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	159.67 187.40 163.82	158.17 185.91 162.28	155.16 162.93 159.17	150.69 148.55 164.82	144.88 142.81 148.84	137.80 135.80 141.34	129.48 127.61 132.82	120.08 118.33 123.16
Coil 0 P	7.077 4.899 10.899	25.590 22.716 28.716	43.225 40.127 46.127	60.746 57.483 63.483	78.226 74.827 80.827	95.706 92.165 98.165	113.170 108.497 115.497	130.608 126.786 132.786
Coil 1 M	291.05 256.02 297.70	288.03 263.03 294.55	282.01 277.09 286.40	273.21 266.45 279.41	261.94 257.53 267.83	248.42 244.00 253.86	232.92 226.71 238.04	215.67 211.79 220.44
Coil 1 P	7.171 4.970 10.970	25.842 22.969 28.989	43.805 40.521 48.521	61.212 57.968 63.988	78.720 75.345 81.345	96.143 92.641 98.641	113.507 109.687 115.687	130.783 127.023 133.023
Coil 2 M	572.37 583.45 568.44	567.11 568.22 561.01	556.41 547.86 567.02	540.61 532.15 553.88	520.15 511.91 532.80	494.97 487.06 506.94	465.61 458.21 478.92	432.18 426.45 442.79
Coil 2 P	7.036 4.899 10.899	25.724 22.716 28.716	43.483 40.127 46.127	61.112 57.483 63.483	78.713 74.827 80.827	96.287 92.165 98.165	113.878 108.497 115.497	131.447 126.786 132.786

Coil 3 M	4.921 10.921	22.865 28.865	40.587 46.587	57.865 63.865	75.299 81.299	92.743 98.743	110.203 116.203	127.605 133.605
	934.39	926.12	909.13	883.90	851.08	810.71	763.29	709.16
Coil 3 P	918.52 956.01	910.31 947.46	883.58 930.03	868.88 904.35	836.50 870.64	786.73 828.25	748.99 780.60	696.86 725.30
	7.070	25.728	43.481	61.120	78.745	96.363	113.996	131.608
Coil 4 M	4.922 10.922	22.839 28.839	40.351 46.351	57.608 63.608	75.267 81.267	92.730 98.730	110.199 116.199	127.678 133.678
	1490.0	1475.6	1445.9	1401.9	1345.4	1277.1	1198.0	1109.0
Coil 4 P	1457.9 1517.4	1443.8 1502.5	1414.5 1472.2	1371.5 1427.5	1315.9 1389.6	1248.4 1289.4	1171.1 1218.9	1084.3 1128.6
	7.252	28.108	44.080	61.908	79.673	97.371	115.043	132.657
Coil 5 M	5.058 11.058	23.224 29.224	40.985 46.985	58.624 64.624	76.241 82.241	93.786 99.786	111.312 117.312	128.780 134.780
	3015.7	2988.4	2930.5	2843.8	2735.2	2597.9	2442.8	2268.3
Coil 5 P	2965.5 3087.8	2939.9 3059.9	2882.2 2999.9	2797.1 2911.5	2689.1 2798.8	2554.4 2658.8	2402.0 2500.1	2228.0 2319.0
	7.275	26.221	44.295	62.246	80.103	97.948	115.809	133.620
	5.068 11.068	23.305 29.305	41.133 47.133	58.892 64.892	76.592 82.592	94.298 100.298	111.947 117.947	129.620 135.620

## INSTRUMENT CONFIGURATION

Source File: /dat1a/624381/m970a"-tdg

### FOCUS CABLEHEAD

Diameter : 3.12"  
Length : 3.17'  
Weight : 15 lbs

### FOCUS SWIVEL

Diameter : 3.13"  
Length : 2.68'  
Weight : 50 lbs

### FOCUS TEN/TMP/MUD RES/ACCEL

Diameter : 3.13"  
Length : 4.31'  
Weight : 91 lbs  
Series : 3980XA  
Mnemonic : TTMA

### FOCUS TELEMETRY (POWER SECTION)

Diameter : 3.13"  
Length : 3.71'  
Weight : 48 lbs  
Series : 3518FB

### FOCUS EB/EO TELEMETRY GAMMA RAY

Diameter : 3.12"  
Length : 5.83'  
Weight : 63 lbs  
Series : 3518EG  
Mnemonic : GR

### FOCUS COMPENSATED NEUTRON

Diameter : 3.13"  
Length : 4.61'  
Weight : 65 lbs  
Series : 2436XA  
Mnemonic : CN

### FOCUS Z-DENSILOG

Diameter : 3.75"  
Length : 9.68'  
Weight : 200 lbs  
Series : 2223XA  
Mnemonic : ZDL

### FOCUS KNUCKLE JOINT

Diameter : 3.13"

### FOCUS KNUCKLE JOINT

Diameter : 3.13"

### FOCUS HIGH DEFINITION INDUCTION TOOL

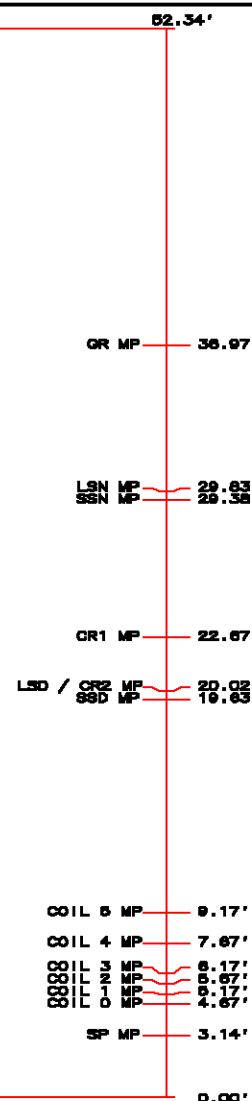
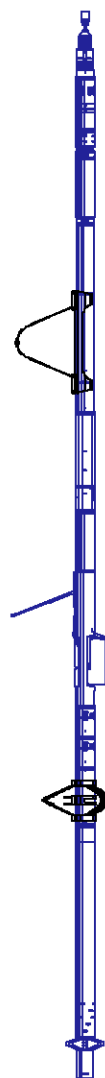
Diameter : 3.13"  
Length : 13.33'  
Weight : 118 lbs  
Series : 1830XA  
Mnemonic : HDIL

### FOCUS PINEAPPLE / CABBAGE

### HOLE FINDER

Diameter : 2.62"

TOTAL LENGTH: 52.34'  
TOTAL WEIGHT: 781 lbs  
MAX DIAMETER: 0"6.13"



COMPANY  
WELL  
FIELD  
COUNTY

FIRST LIBERTY ENERGY INC  
BASIN #1  
DEL NORTE  
RIO GRANDE

STATE CO

LOCATION:

ELEVATIONS:  
KB 8103 5 FT

FILE NO:  
US624381  
API NO:  
05105060190000

D&W RIG #1





NESE 59; T40N; RSE  
1900' FSL 660 FEL  
LAT: 37.726122 LON: -106.425207  
SEC 9 TWP 40N RGE 5E

RD 0190.3 FT  
DF  
GL 8176 FT

DATE 07-MAR-2013