



FILE NO: OH101021  
 COMPANY: WPX ENERGY INC  
 WELL: FEDERAL RU 21-8  
 FIELD: RULISON  
 COUNTY: GARFIELD STATE: COLORADO  
 API NO: 05045227830000

Ver. 4.05  
 SEC 8 T7S R93W  
 PAD 21-8  
 RIG H&P 318  
 LOCATION: SHL: 653' FNL 1876' FWL  
 BHL: 627' FNL 1436' FWL  
 SEC 8 TWP 7S RGE 93W  
 OTHER SERVICES: NONE

PERMANENT DATUM: GL ELEVATION 7736 FT  
 LOG MEASURED FROM: KB 24 FT ABOVE P.D.  
 DRILL. MEAS. FROM: KB  
 ELEVATIONS: KB 7760 FT, DF, GL 7736 FT

DATE	25-NOV-2015	
RUN	TRIP	1
SERVICE ORDER	US101021J	
DEPTH DRILLER	10000 FT	
DEPTH LOGGER	9999 FT	
BOTTOM LOGGED INTERVAL	9996 FT	
TOP LOGGED INTERVAL	0 FT	
CASING DRILLER	9.625 IN @ 1220 FT	
CASING LOGGER	1220 FT	
BIT SIZE	8.75 IN	
TYPE OF FLUID IN HOLE	LSND	
DENSITY	10.3 LB/G	60 CP
PH	9	5.2 C3
SOURCE OF SAMPLE	MUD TANK	
RM AT MEAS. TEMP.	0.68 OHMM	@ 59.5 DEGF
RMF AT MEAS. TEMP.	0.51 OHMM	@ 59.5 DEGF
RMC AT MEAS. TEMP.	0.85 OHMM	@ 59.5 DEGF
SOURCE OF RMF	RMC	CALCULATED
RM AT BHT	0.43 OHMM	@ 193 DEGF
TIME SINCE CIRCULATION	6 HOURS	
MAX. RECORDED TEMP.	193 DEGF	
EQUIP. NO.	LOCATION	6685 GRAND JCT
RECORDED BY	W. QUIGLEY	
WITNESSED BY	MR. BEAUDE OAKS	

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.

BOREHOLE RECORD		
BIT SIZE	FROM	TO
8.75 IN	1220 FT	10000 FT

CASING RECORD				
SIZE	WEIGHT	GRADE	FROM	TO
9.625 IN	32.3 LB/F		0 FT	1220 FT

**REMARKS**

RUN 1 TRIP 1: HDIL ZDL CN GR RAN IN COMBINATION

BVOL CVOL CALCULATED IN CUBIC FT  
 CVOL CALCULATED USING PROPOSED 4.5" CASING  
 CALIPER VERIFIED INSIDE CASING

RHO MATRIX: 2.68 G/CC  
 RHO FLUID: 1.00 G/CC

CN MATRIX: SANDSTONE  
 CN RAN DECENTRALIZED

HDIL RAN WITH 1.5" STANDOFFS  
 ABC TO CALCULATE MUD CONDUCTIVITY

THANK YOU FOR CHOOSING BAKER HUGHES WIRELINE SERVICES  
 CREW: COATE/NEWELL/QUIGLEY  
 RIG: H&P 318

BOREHOLE IS FAIRLY RUGOSE. THIS WILL AFFECT THE ACCURACY OF MEASUREMENTS.

**EQUIPMENT DATA**

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	SWIVEL	3950XA	10119949	FREE
1	1	TTMA	3980XA	10121559	FREE
1	1	TELEMETRY	3518FB	10137522	DECENTRALIZED
1	1	GR	3518EB	10126398	DECENTRALIZED
1	1	CN	2436XA	10522099	DECENTRALIZED
1	1	ZDL	2223XA	10090664	CALIPER DEVICE
1	1	KNUCKLE	3930XA	10139400	FREE
1	1	HDIL	1530XA	10415933	STOOD OFF

**MAIN LOG 5"/100FT SCALE**

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013  
 Updates: 1 Patches: 8

Plotted: Wed Nov 25 18:39:37 2015

**PARAMETER AND FILTER SUMMARY REPORT**

FILE: /dat1a/OH101021/n970a02.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 1115.147 ft BOTTOM DEPTH: 10022.804 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.	4.500	in	TOP	BOTTOM
	CASING THICKNESS	0.000	in	"	"
BIT SIZE	BIT SIZE	8.750	in	"	"
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (mbh*)	USE CALIPER		"	"
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	8.750	in	"	"
	FIXED DIAMETER (mbh*)	8.750	in	"	"
BH MUD RESISTIVITY SOURCE	RMUD SOURCE (HDIL)	TOOL MEASURED		"	"
MUD SAMPLE RESISTIVITY	MUD SAMPLE TEMP	59.5	degF	"	"
	MUD SAMPLE RES	0.680	ohm.m	"	"
BOREHOLE TEMP from GRADIENT	Known BH REF TEMP	59.5	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	3100	ppm	"	"
	BOREHOLE CORRECTION	ON		"	"
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)	
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	in	"	"
	TOOL POSITION	ECCENTERED		"	"
	Rmud MULTIPLIER	1.000		"	"

## CURVE DESCRIPTION REPORT

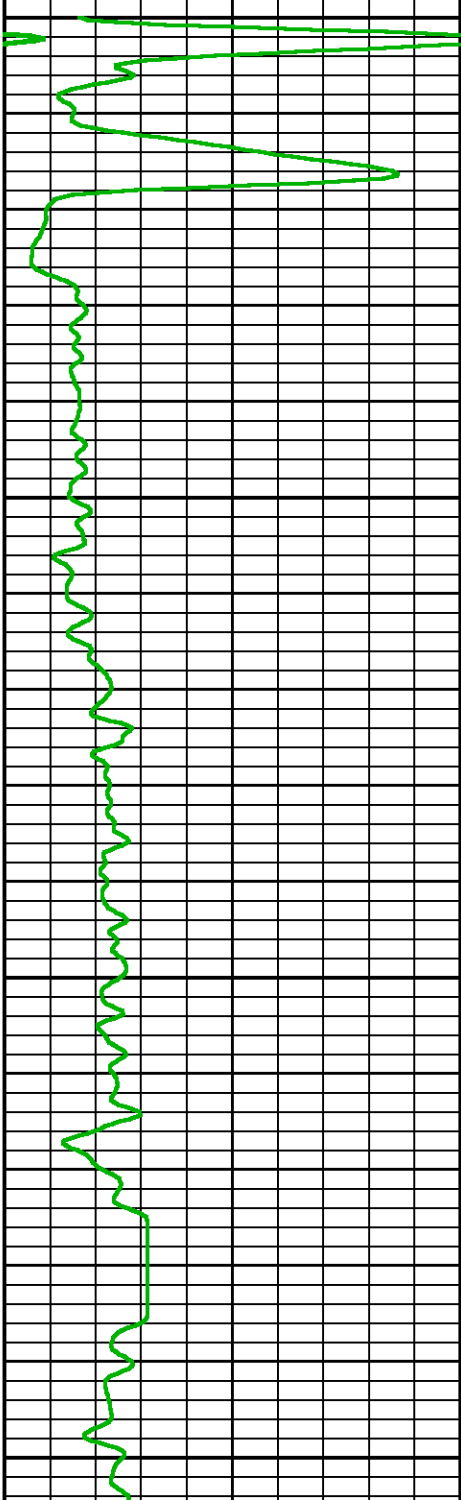
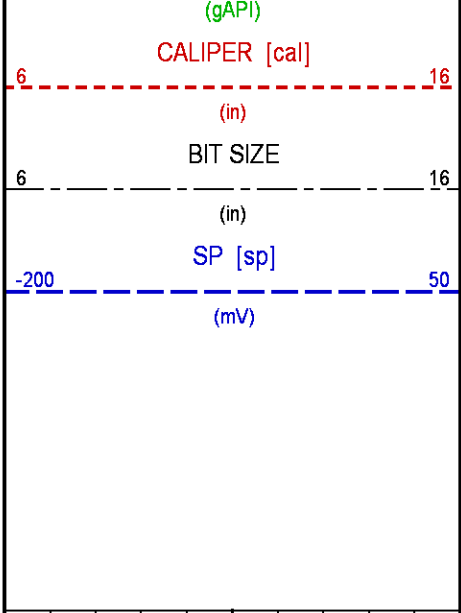
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BIT	Nov 25 15:46:16 2015	BIT SIZE
F1:BVOL	Nov 25 15:46:16 2015	BOREHOLE VOLUME
F1:CAL	Nov 25 15:46:16 2015	CALIPER
F1:CNCF	Nov 25 15:46:16 2015	FIELD NORMALIZED COMPENSATED NEUTRON POROSITY
F1:CVOL	Nov 25 15:46:16 2015	CEMENT VOLUME
F1:GR	Nov 25 15:46:16 2015	GAMMA RAY
F1:M2R1	Nov 25 15:46:16 2015	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 10-INCH DOI
F1:M2R6	Nov 25 15:46:16 2015	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 60-INCH DOI
F1:M2R9	Nov 25 15:46:16 2015	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 90-INCH DOI
F1:PE	Nov 25 15:46:16 2015	PHOTO ELECTRIC CROSS-SECTION
F1:PORZ	Nov 25 15:46:16 2015	POROSITY FOR SELECTABLE MATRIX
F1:SP	Nov 25 15:46:16 2015	SPONTANEOUS POTENTIAL
F1:TEN	Nov 25 15:46:16 2015	DIFFERENTIAL TENSION
F1:ZCOR	Nov 25 15:46:16 2015	DENSITY CORRECTION

## CURVE MEASURE POINT OFFSET

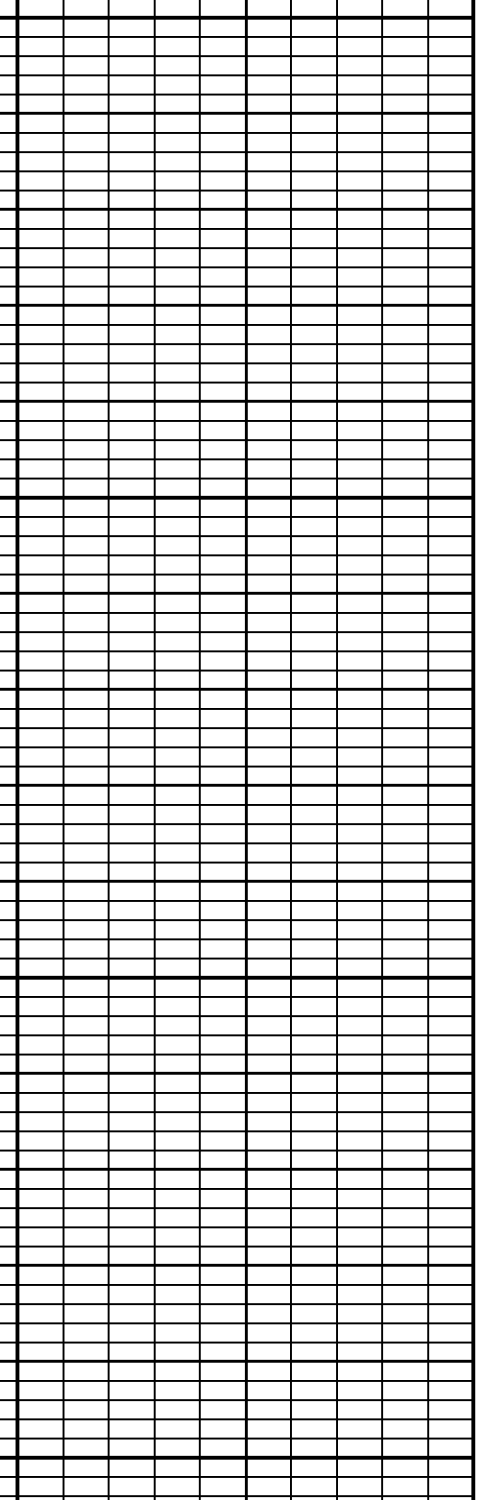
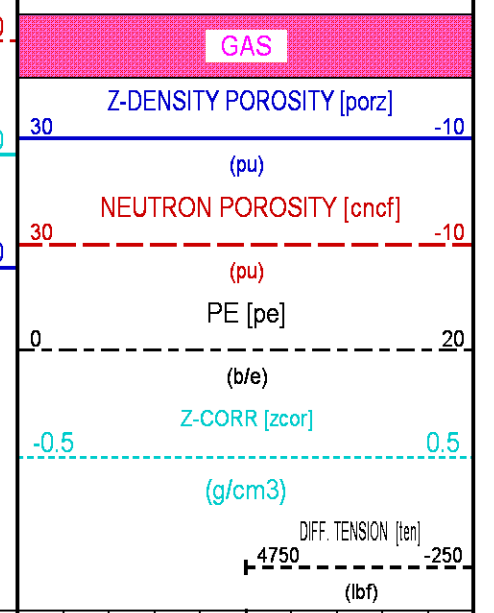
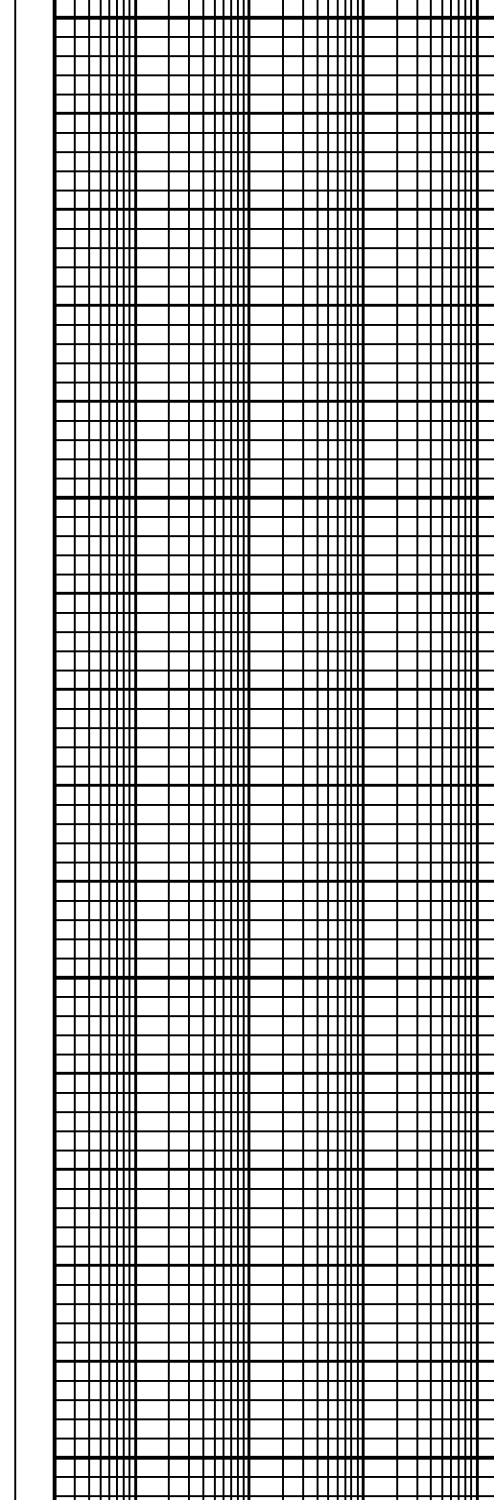
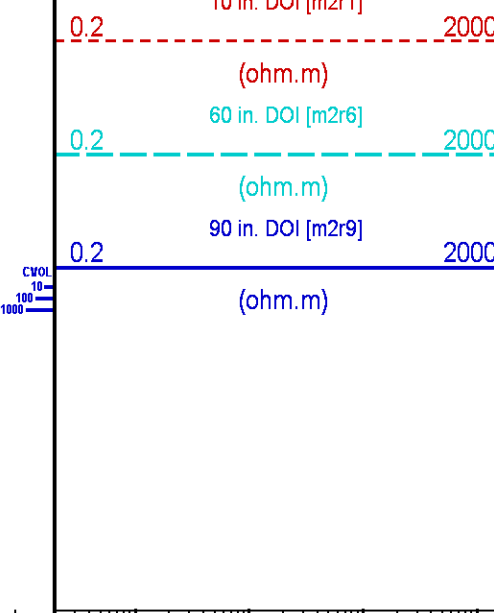
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
BIT	0.00	GR	35.00	M2R9	2.75	SP	1.25
CAL	18.12	M2R1	2.75	PE	18.00	TEN	0.00
CNCF	27.38	M2R6	2.75	PORZ	18.00	ZCOR	18.00

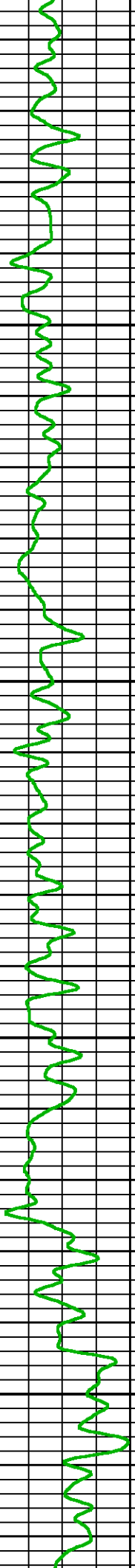
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**Plot Interval** : 1076.75 - 10032.5 Feet  
  
**Data File 1** : F1 : cas6685:/dat1a/OH101021/n970a02\_MAIN.xtf  
**Created On** : Nov 25 15:46:16 2015  
**Company** : WPX ENERGY INC  
**Well** : FEDERAL RU 21-8  
**Field** : RULISON  
**File Interval** : 1076.75 - 10032.5 Feet  
**OCT** : n970a





BT  
 0  
 100





200

300

400

500

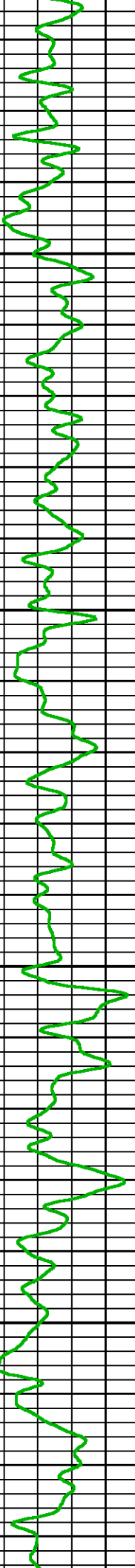


600

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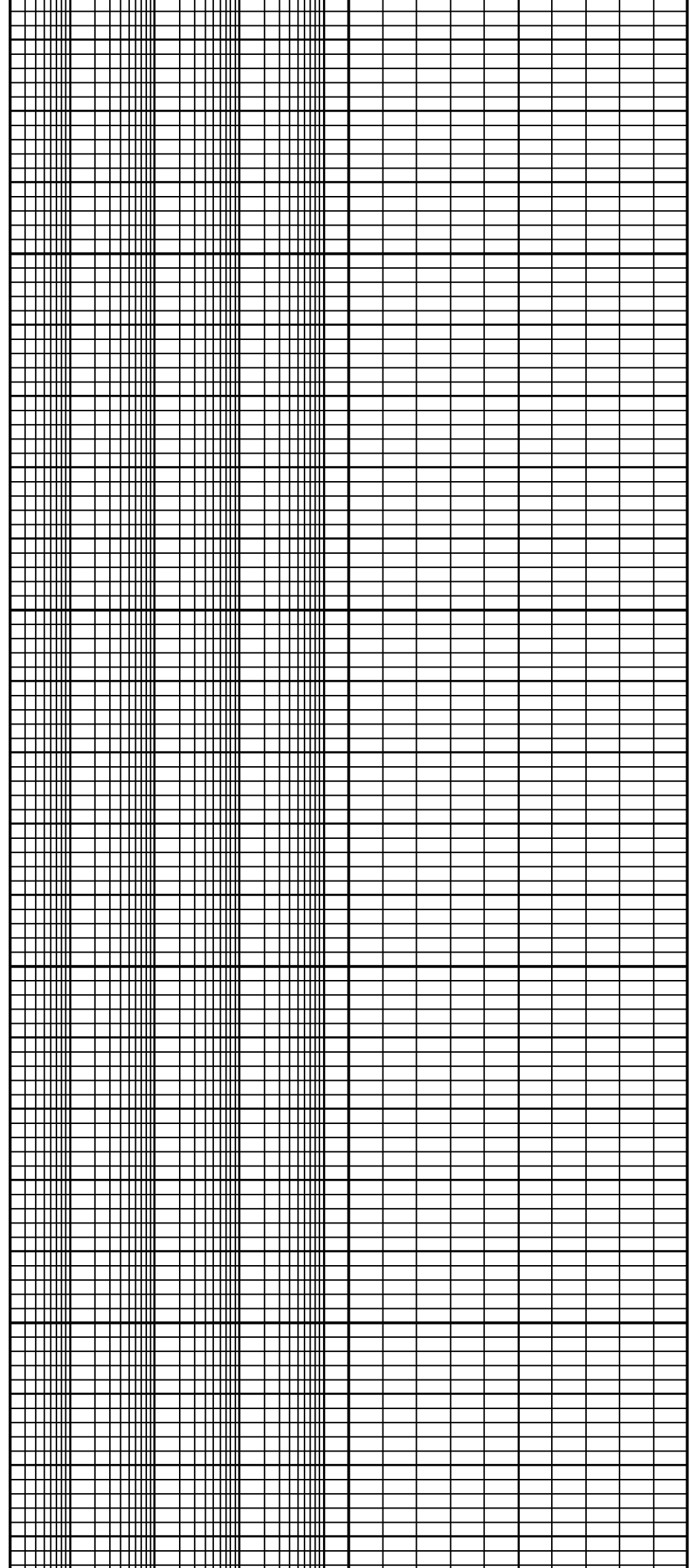
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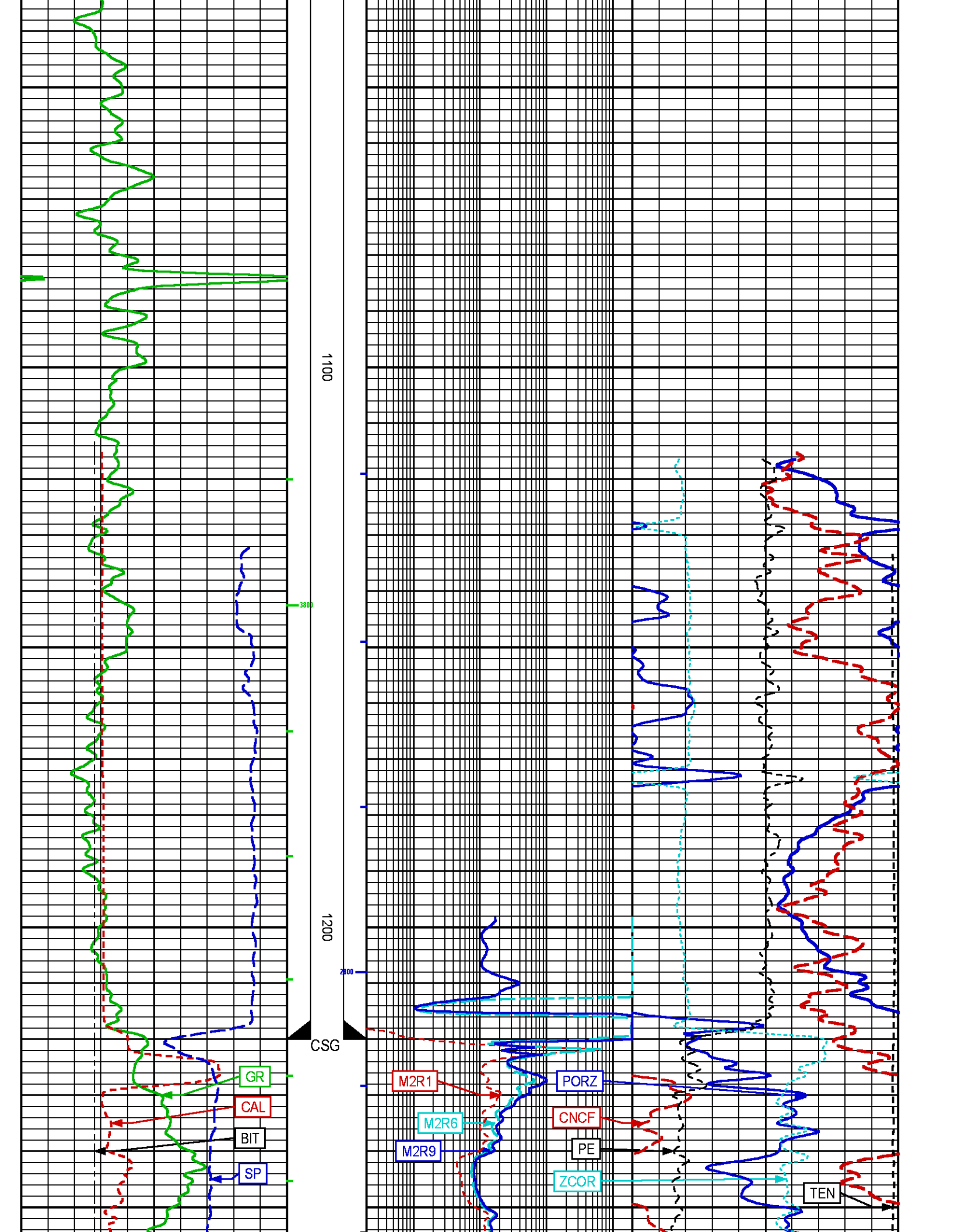


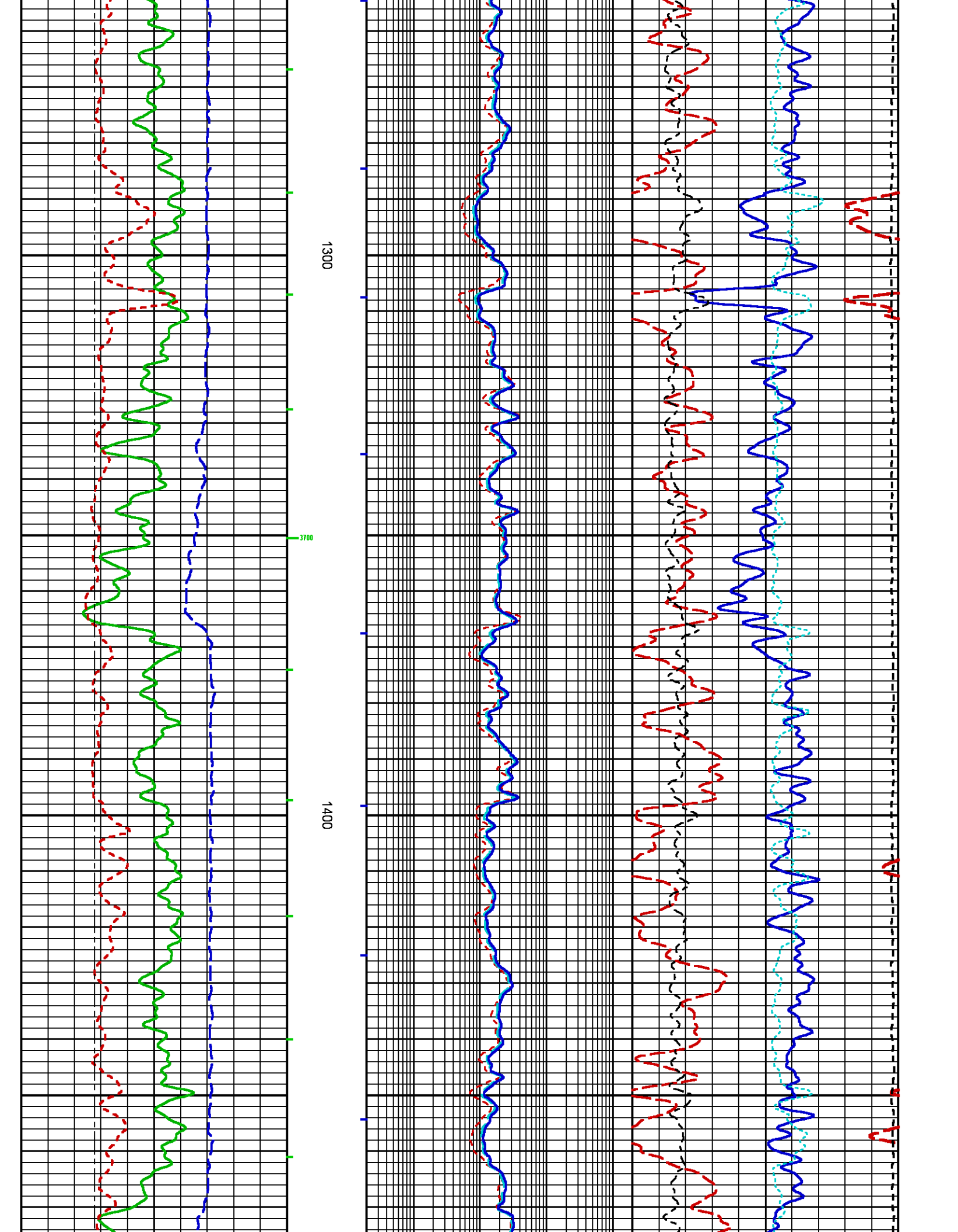


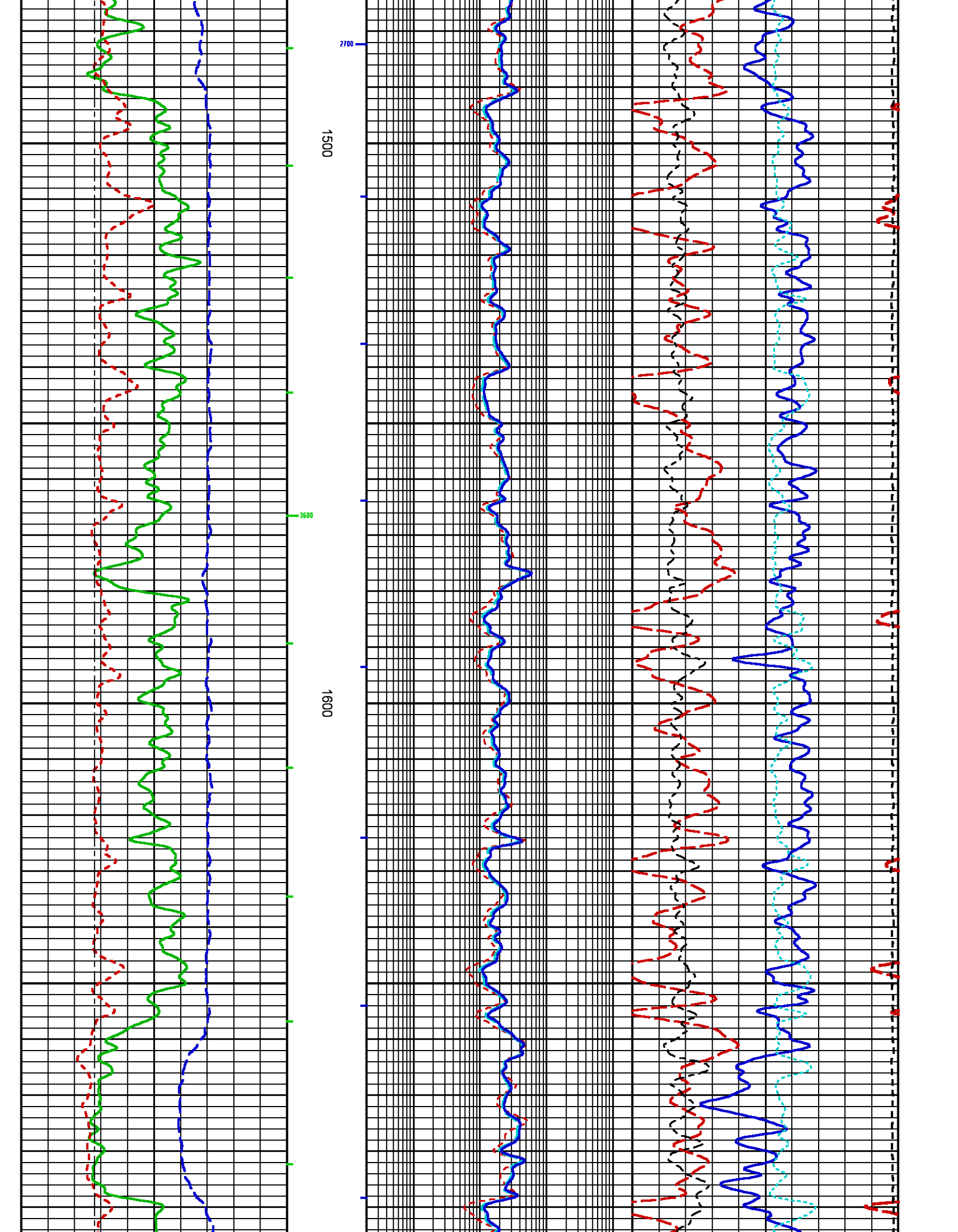
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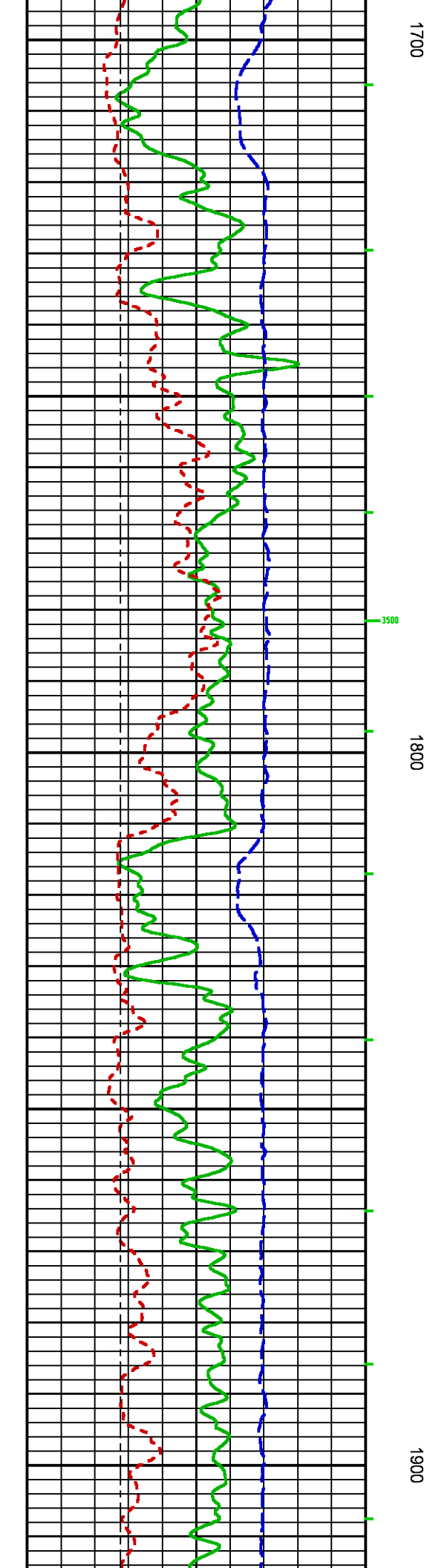
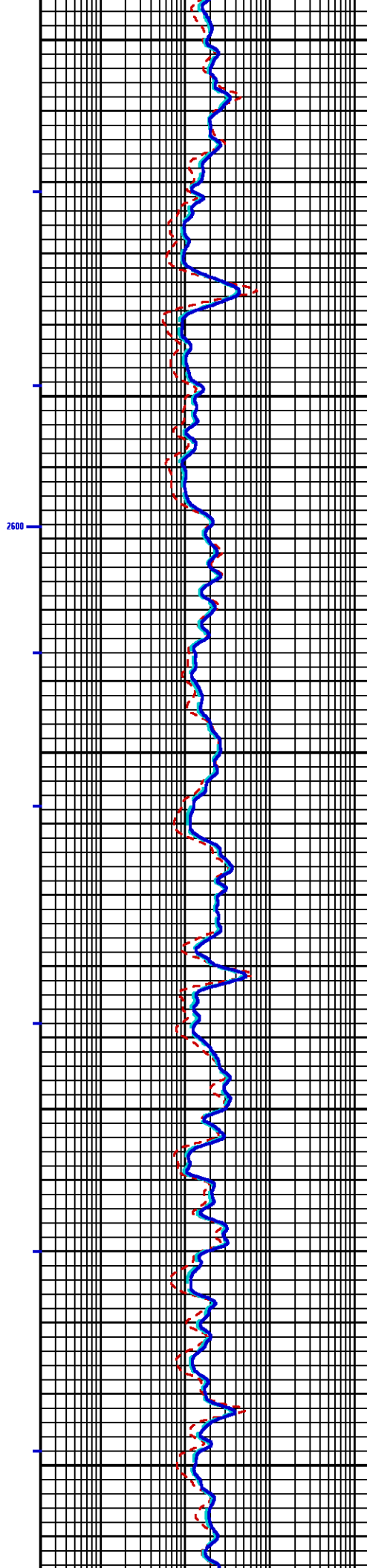
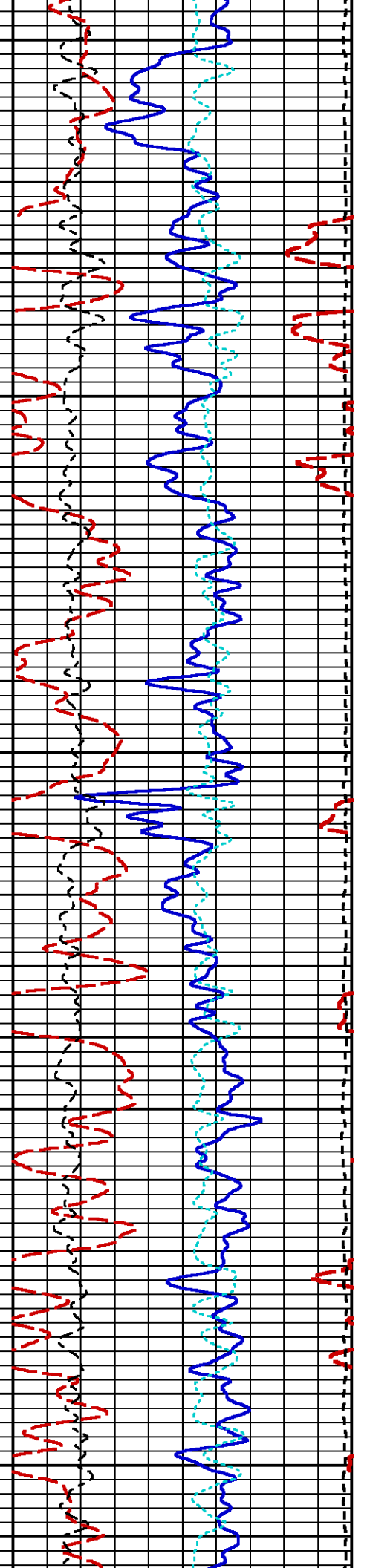
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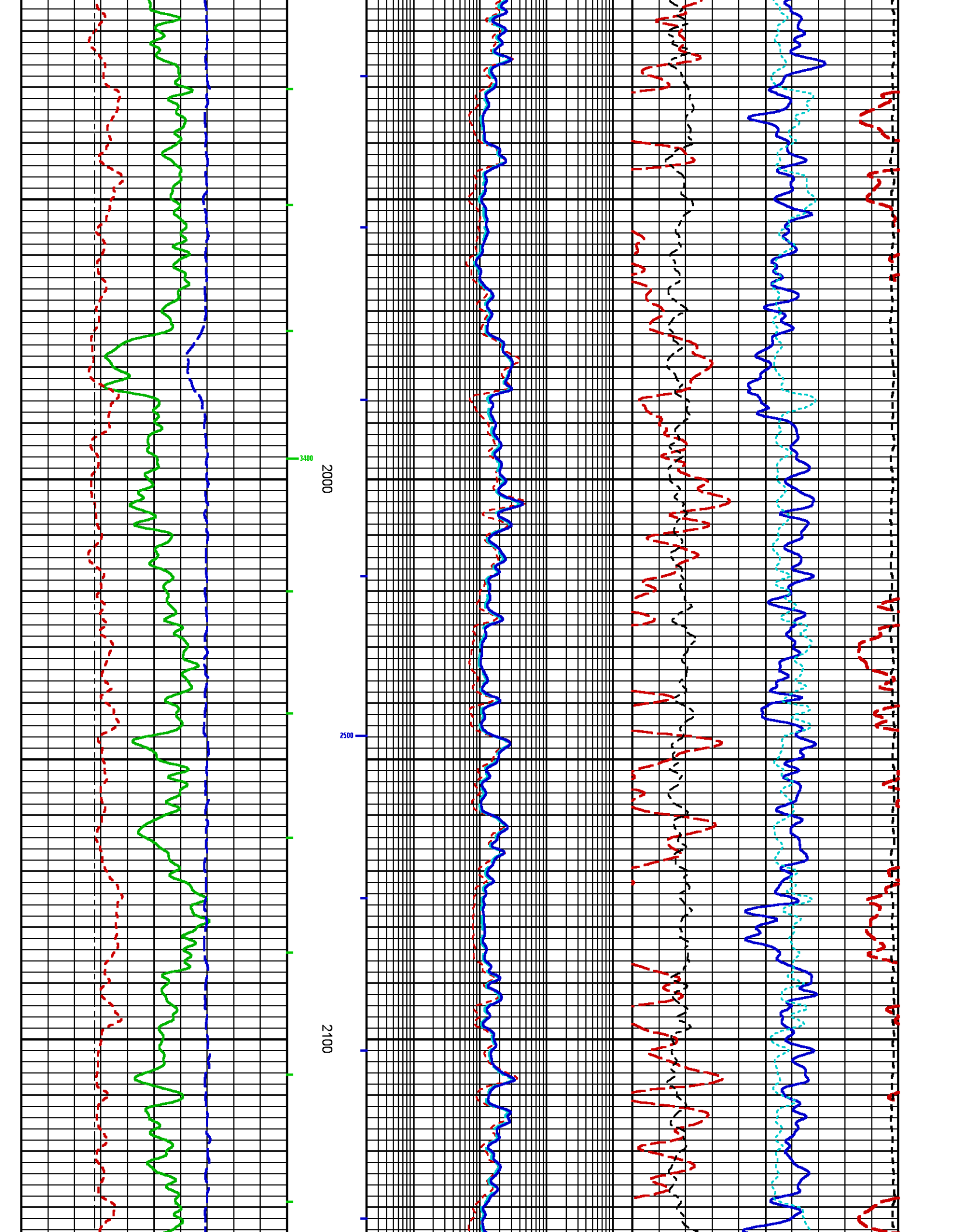


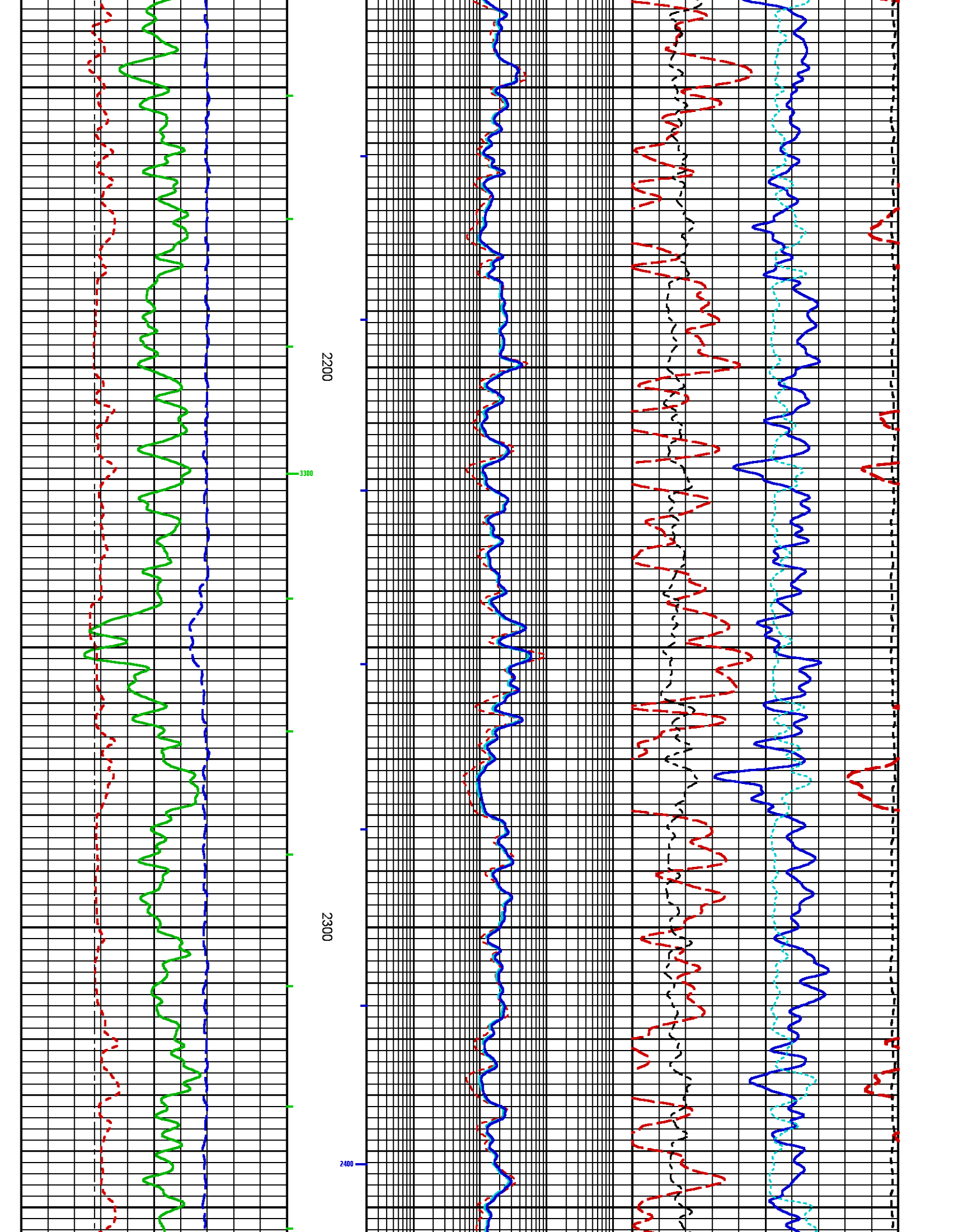


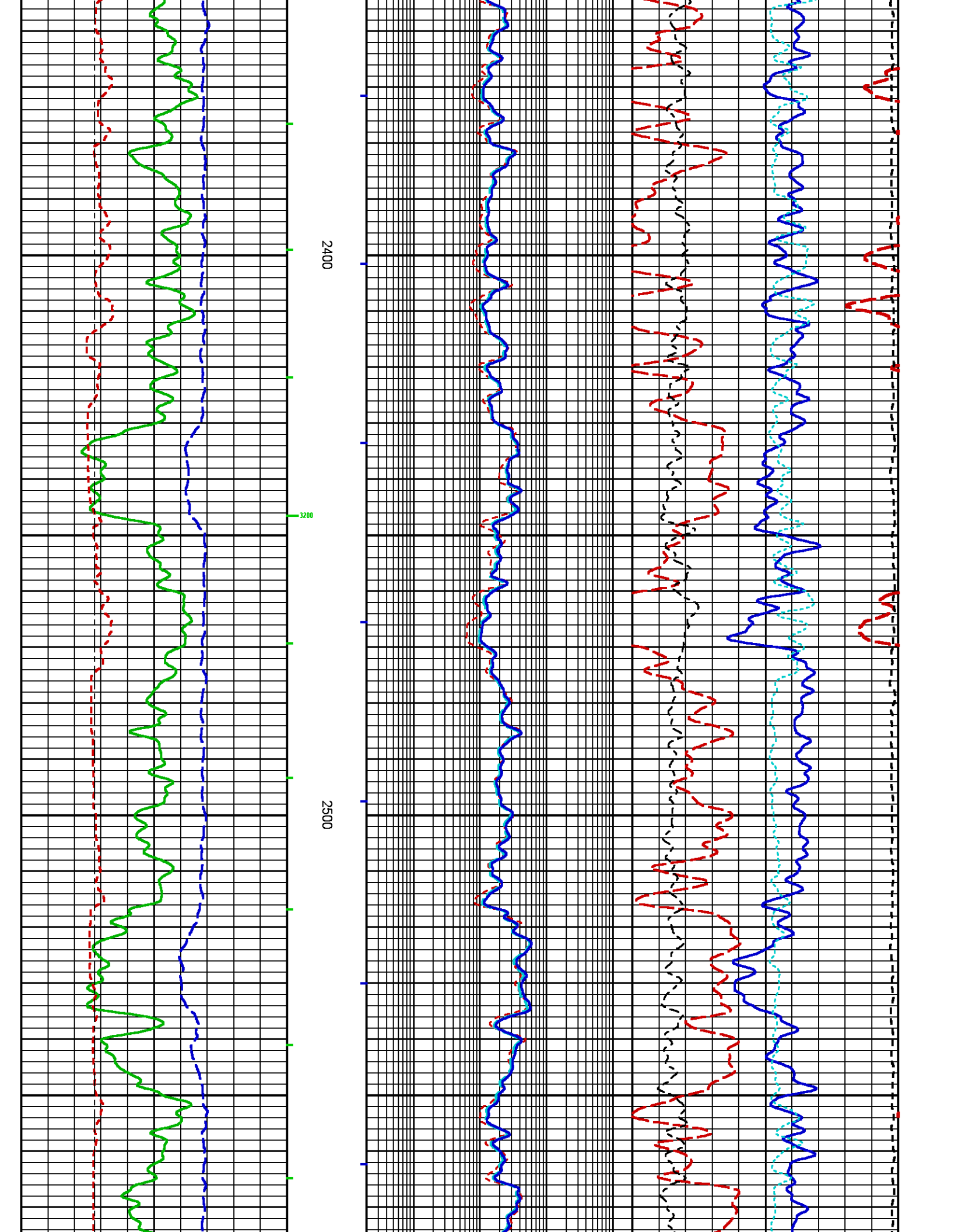


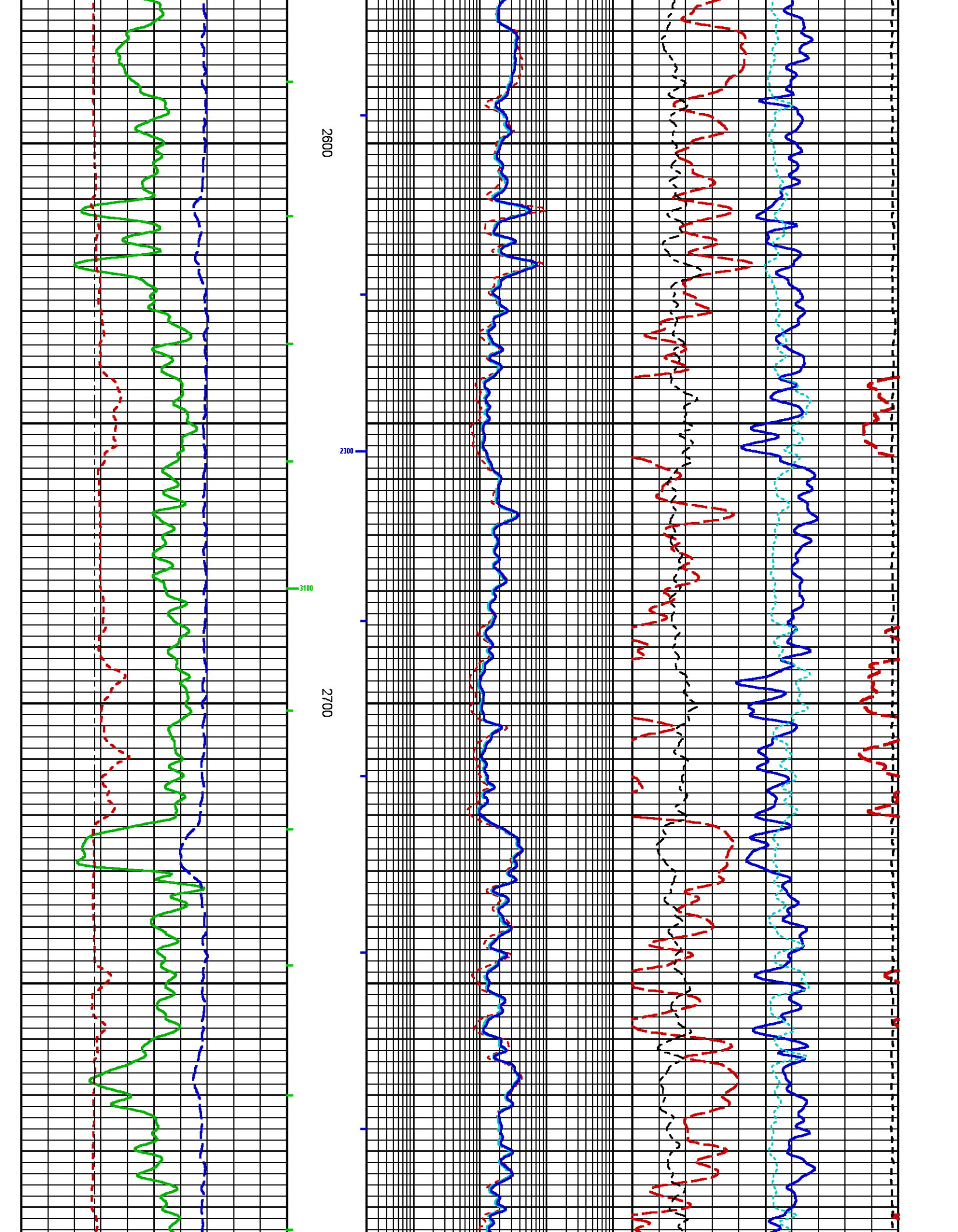


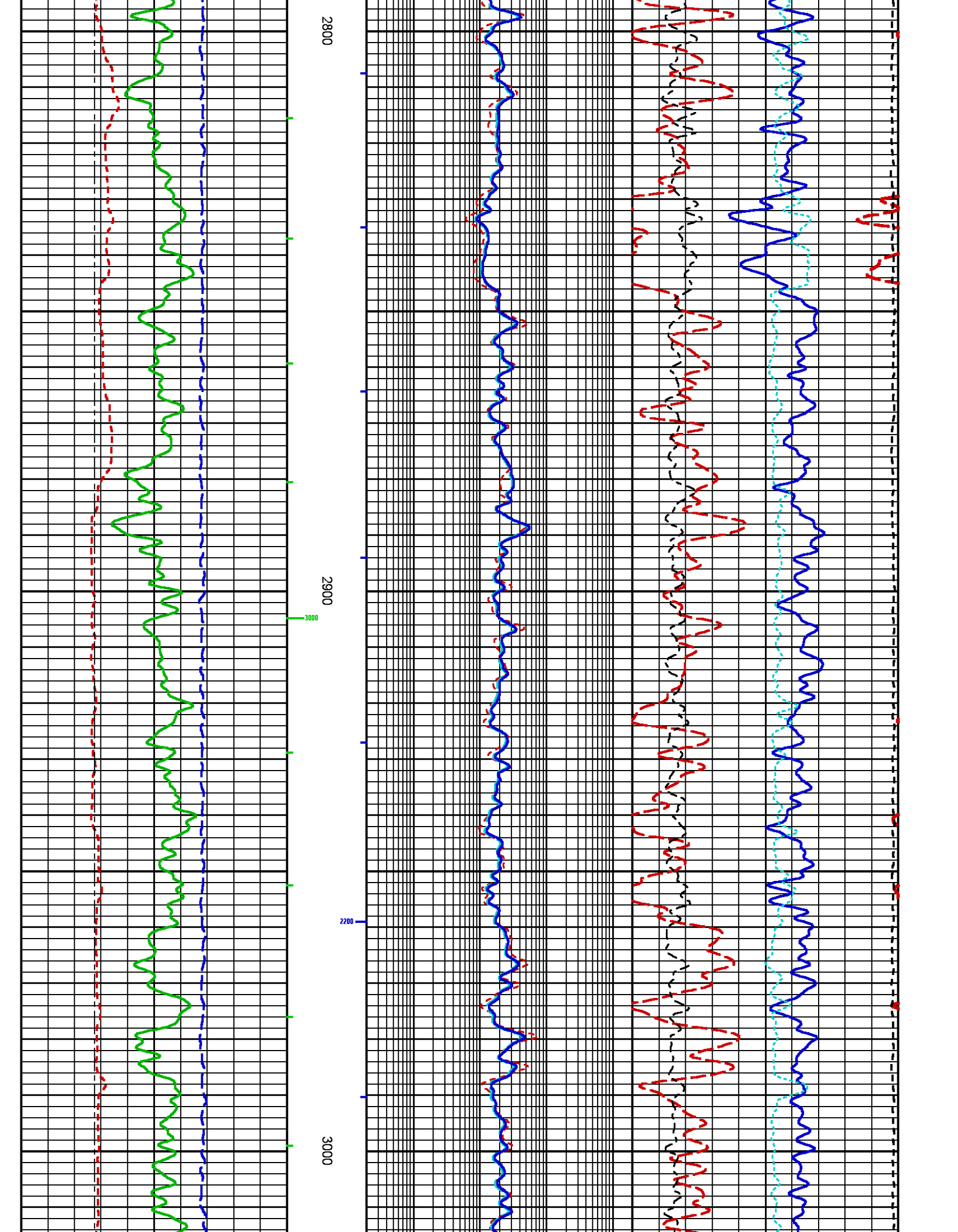




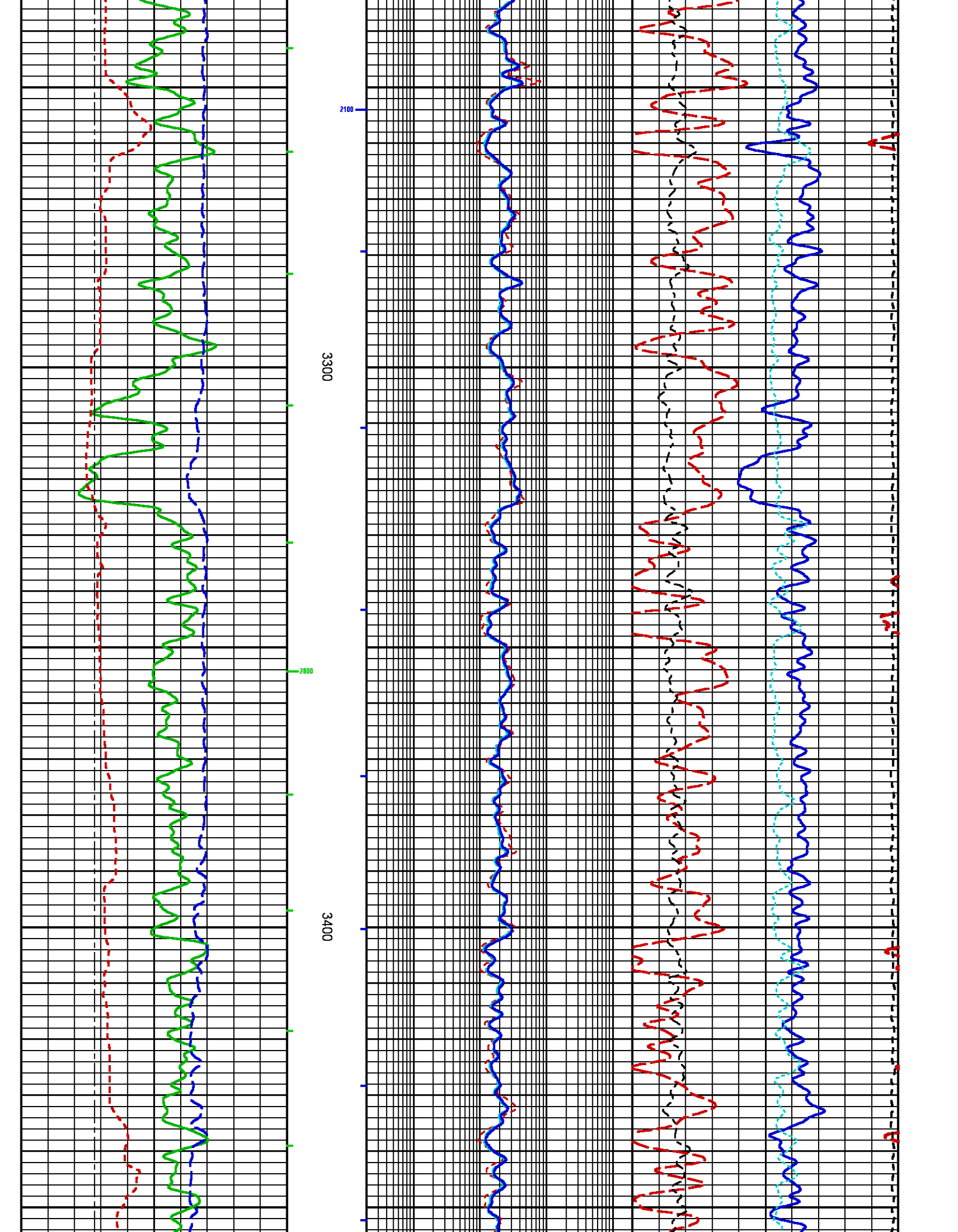


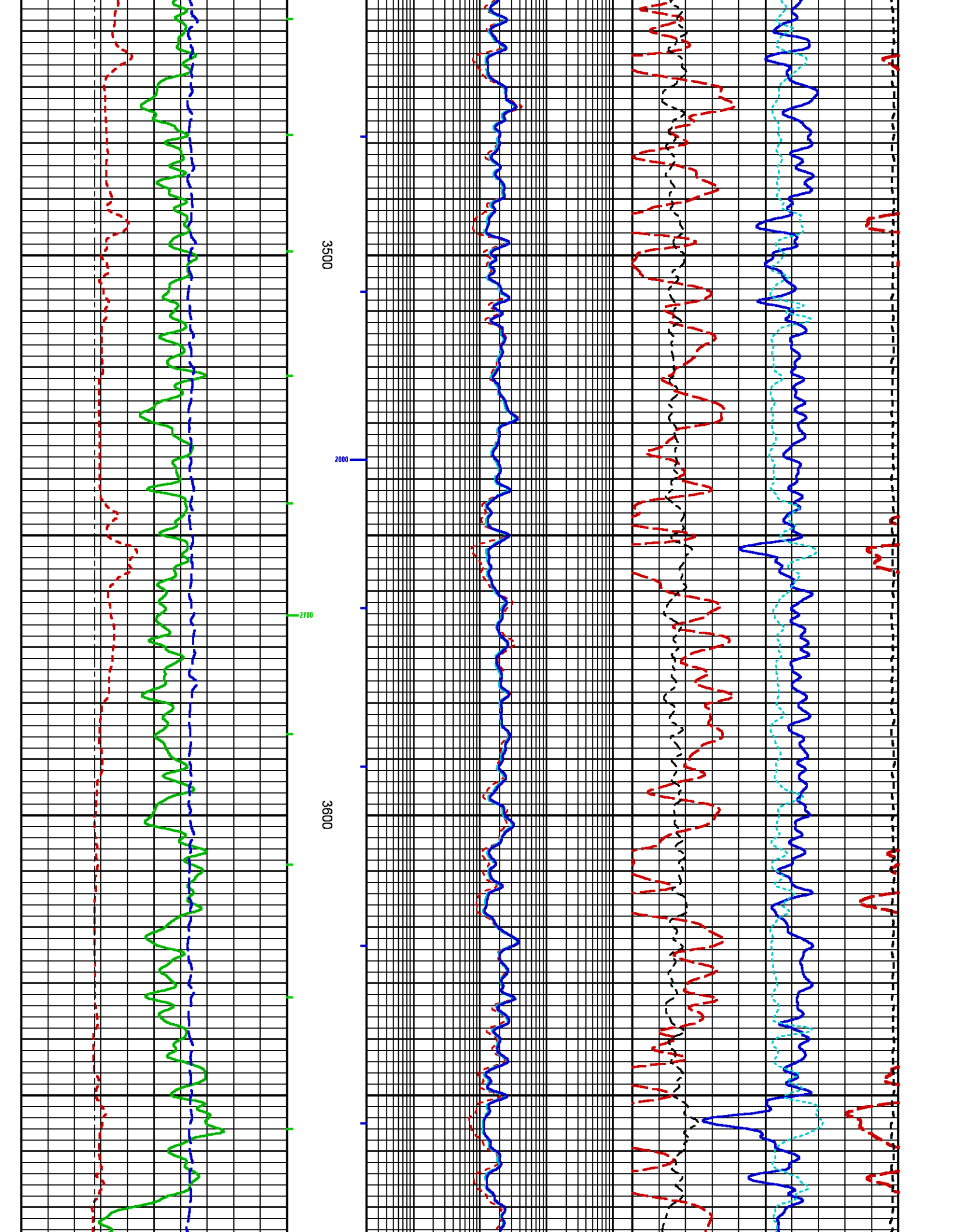


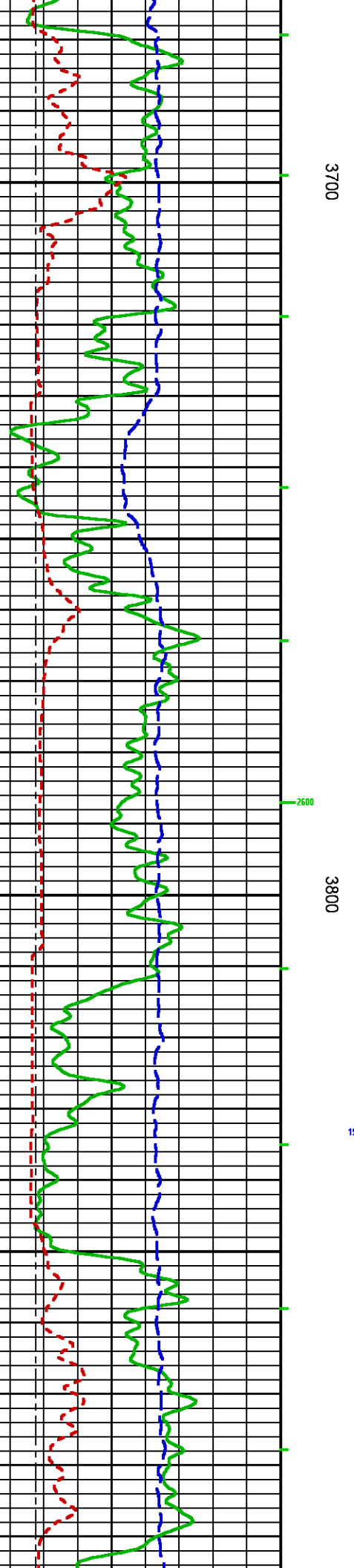
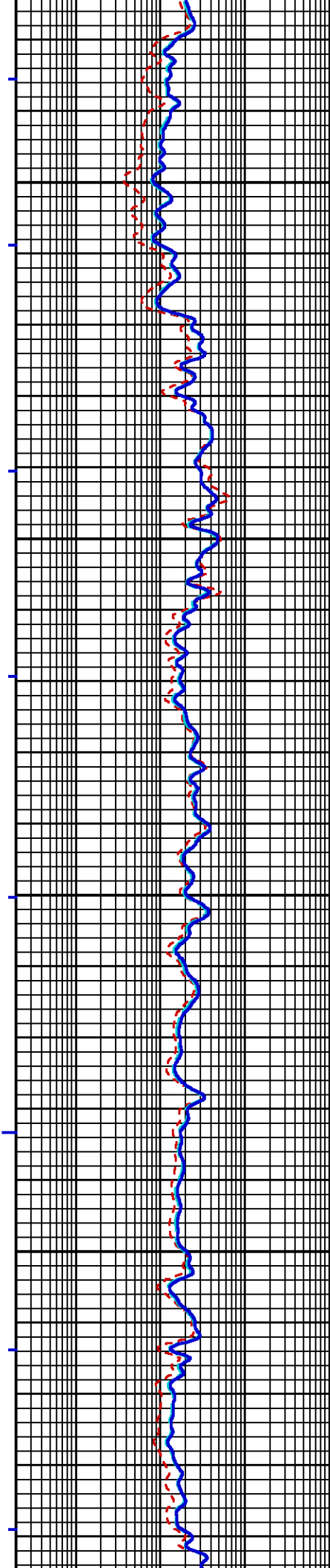
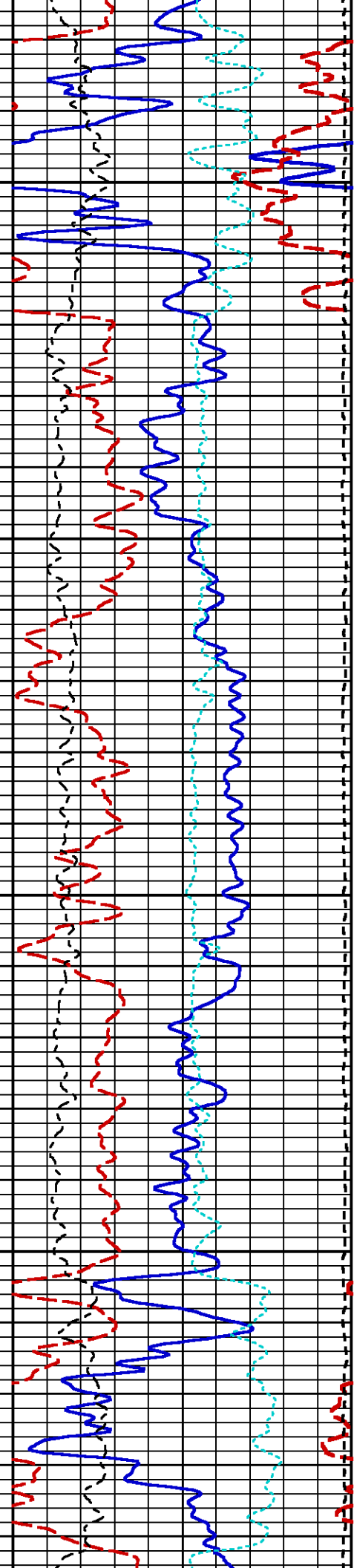


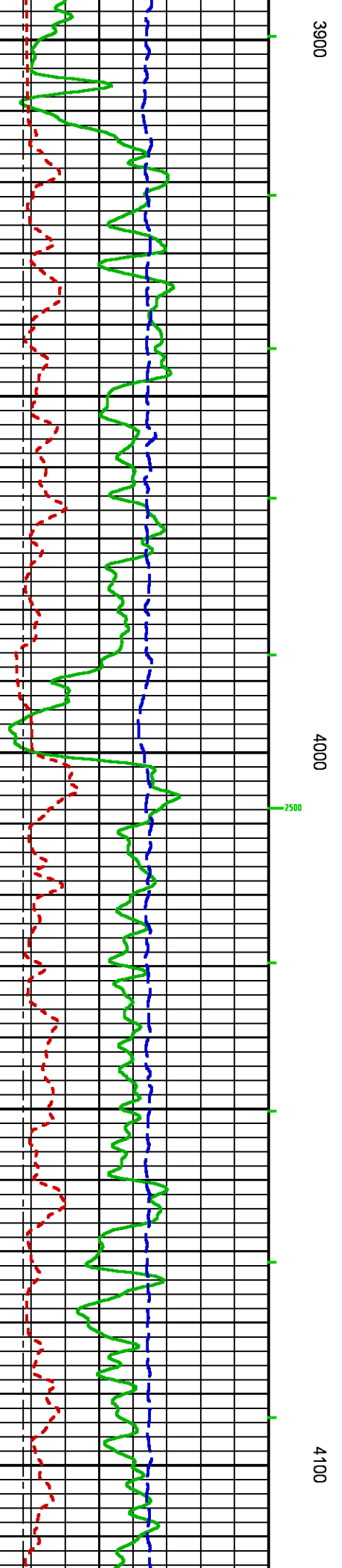
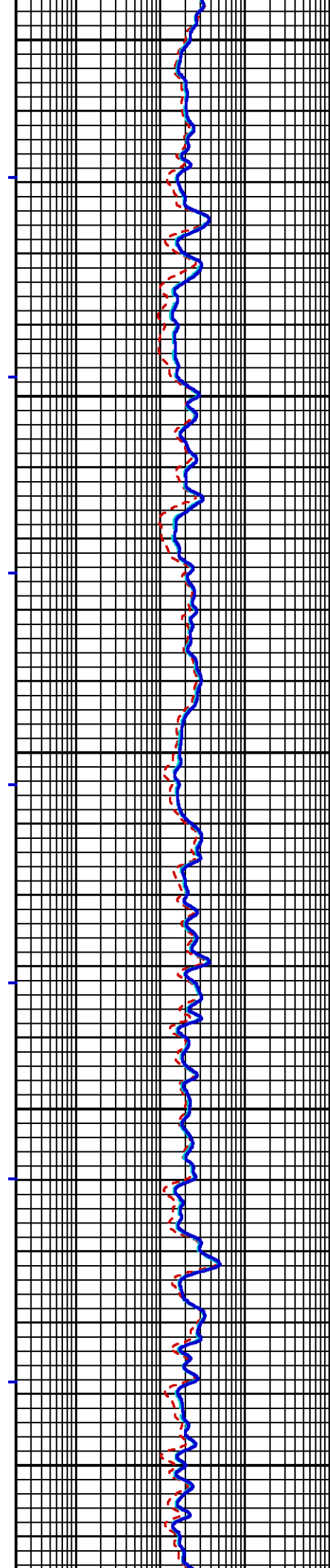
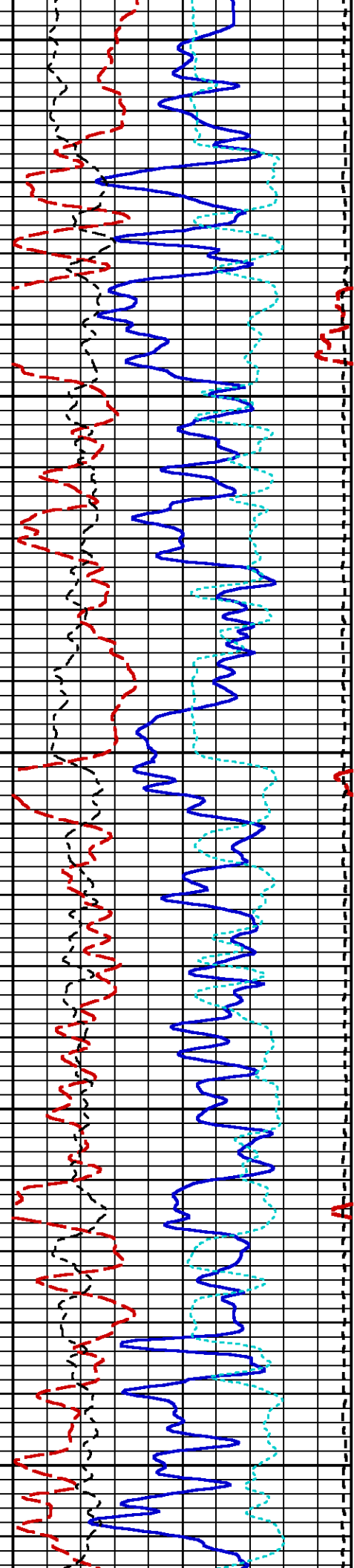


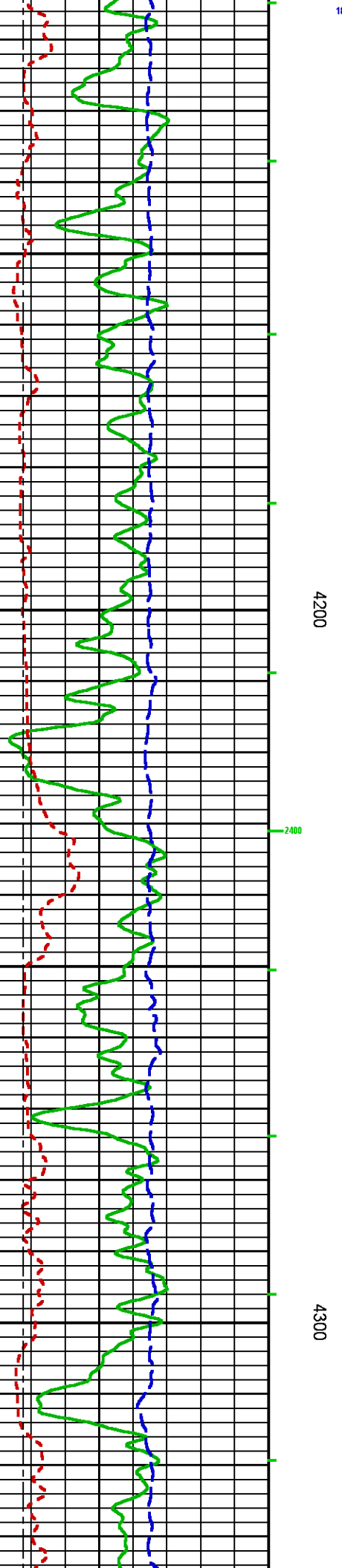
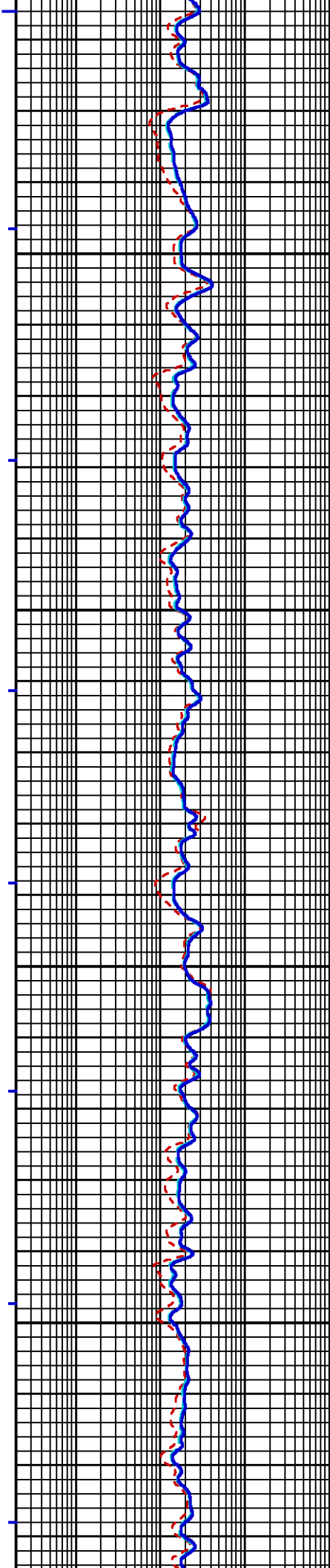
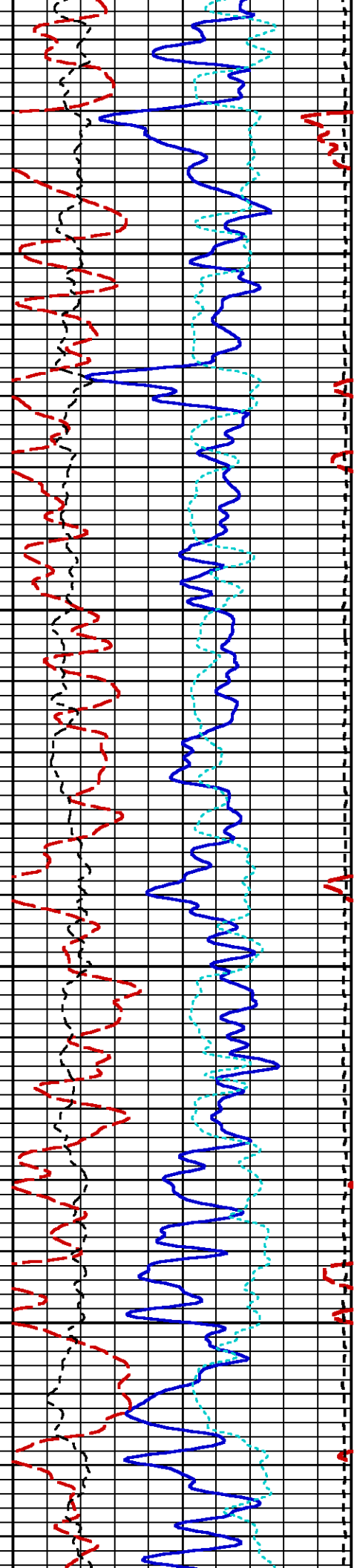


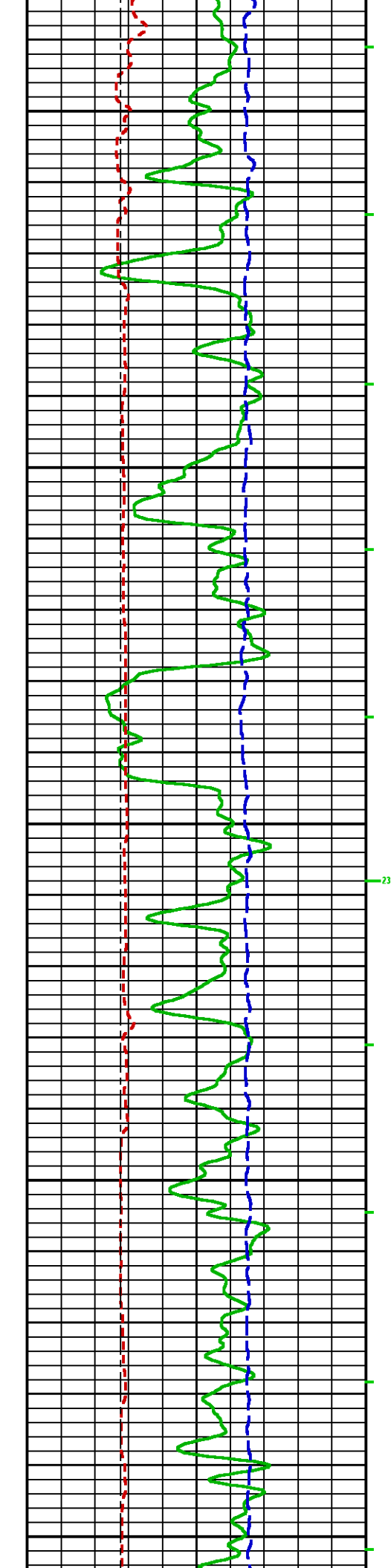
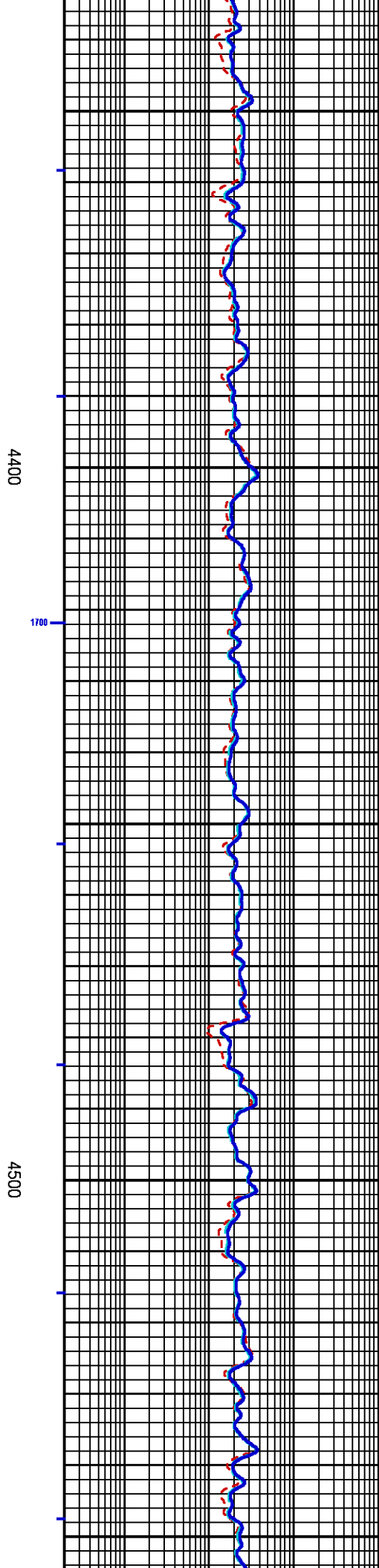
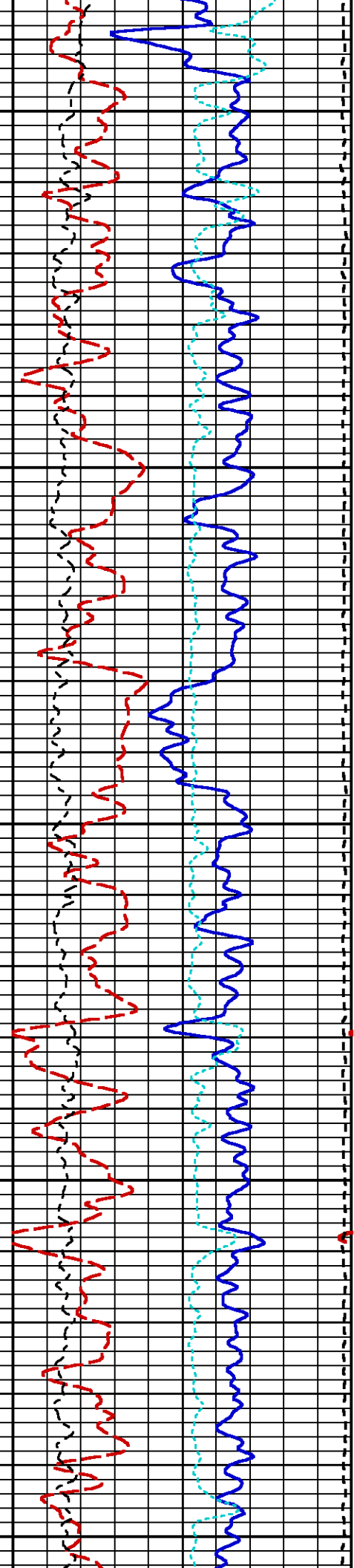


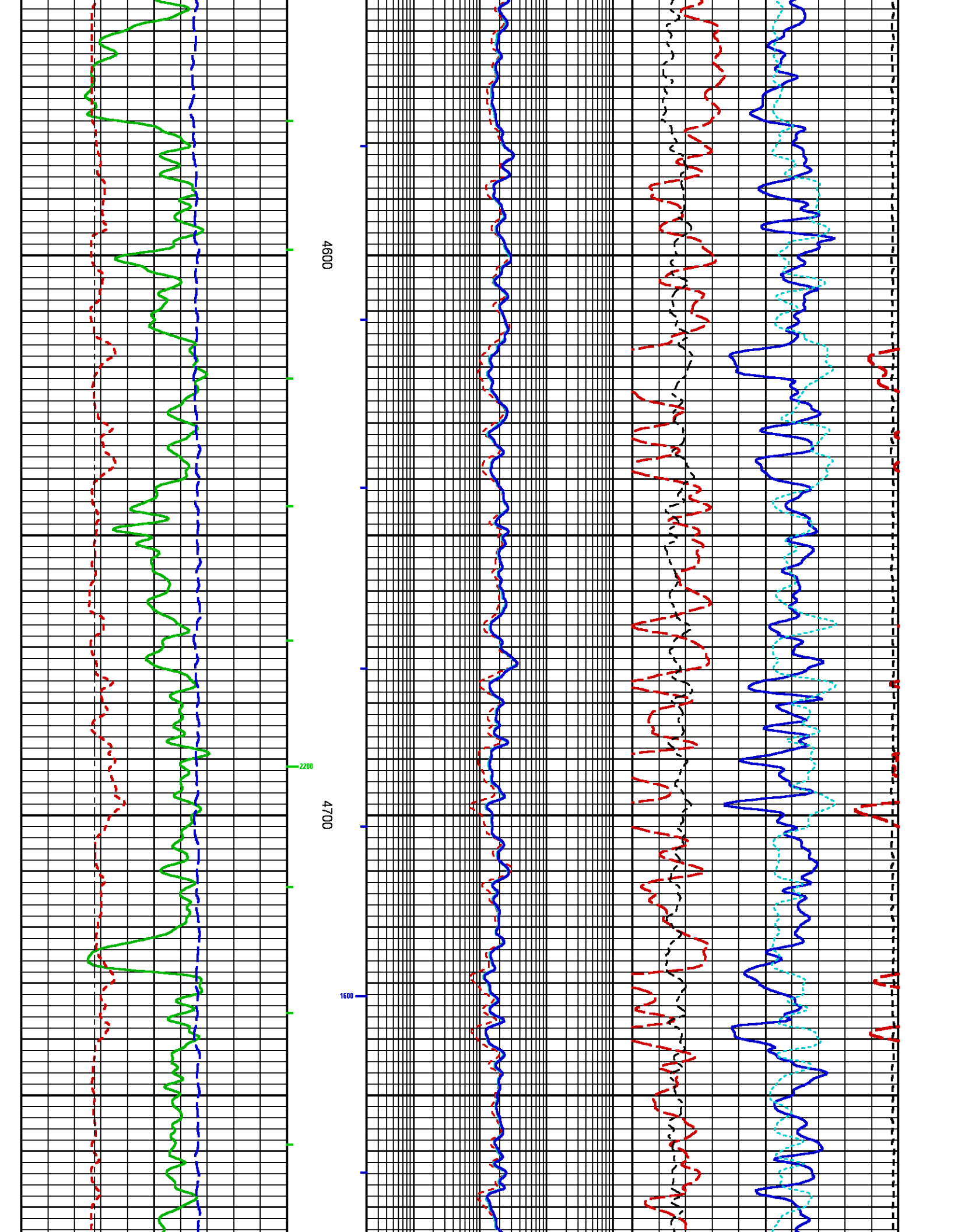


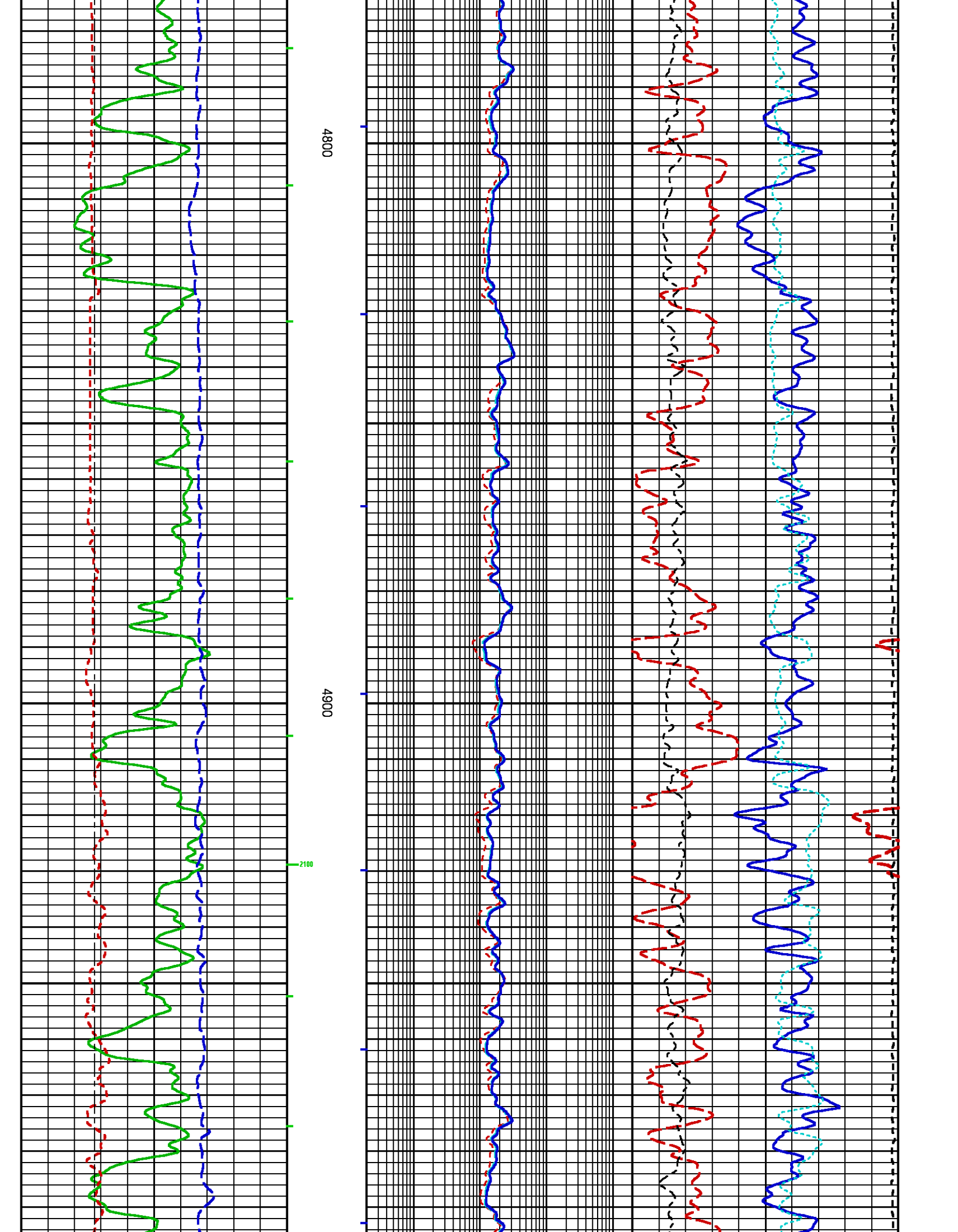


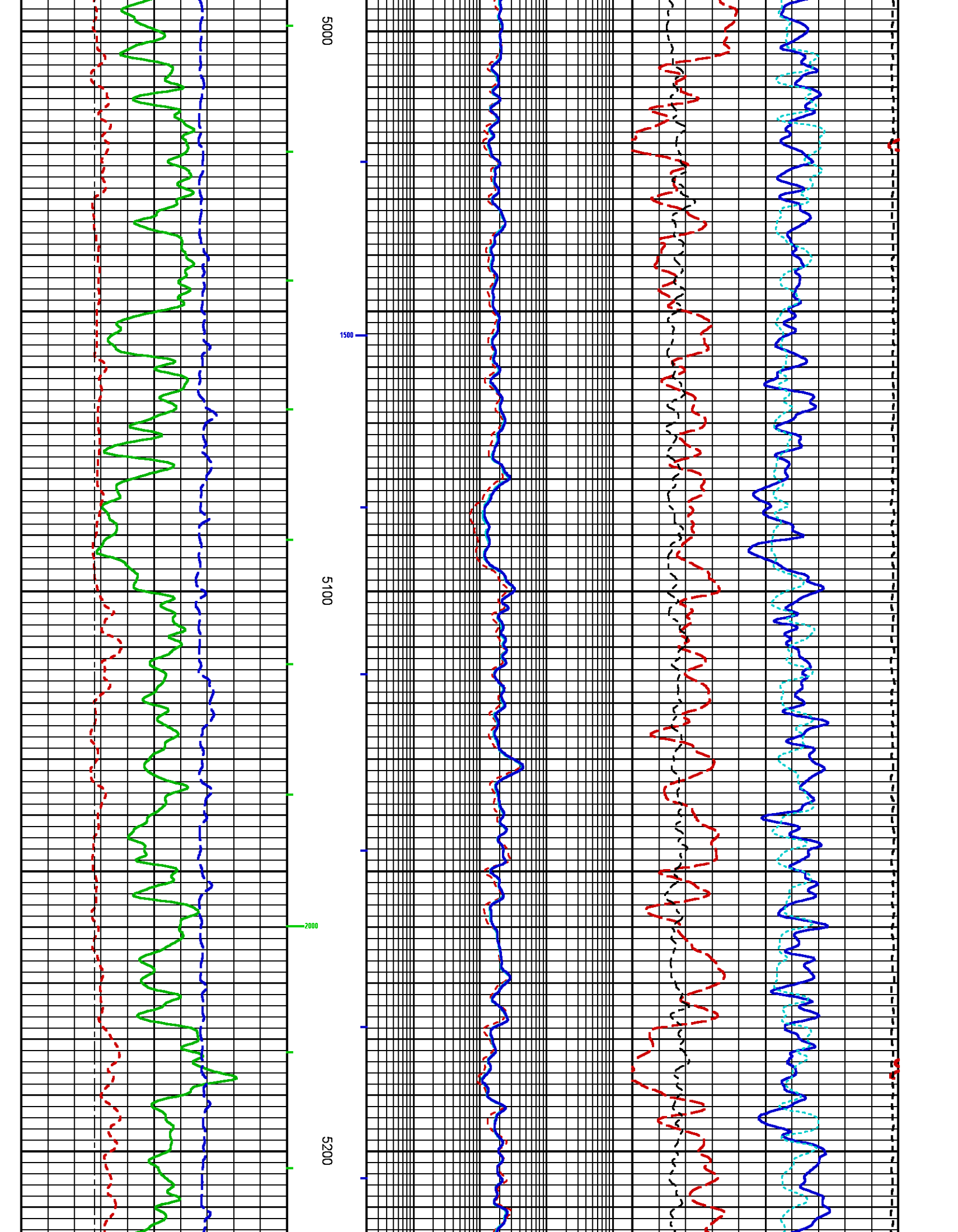


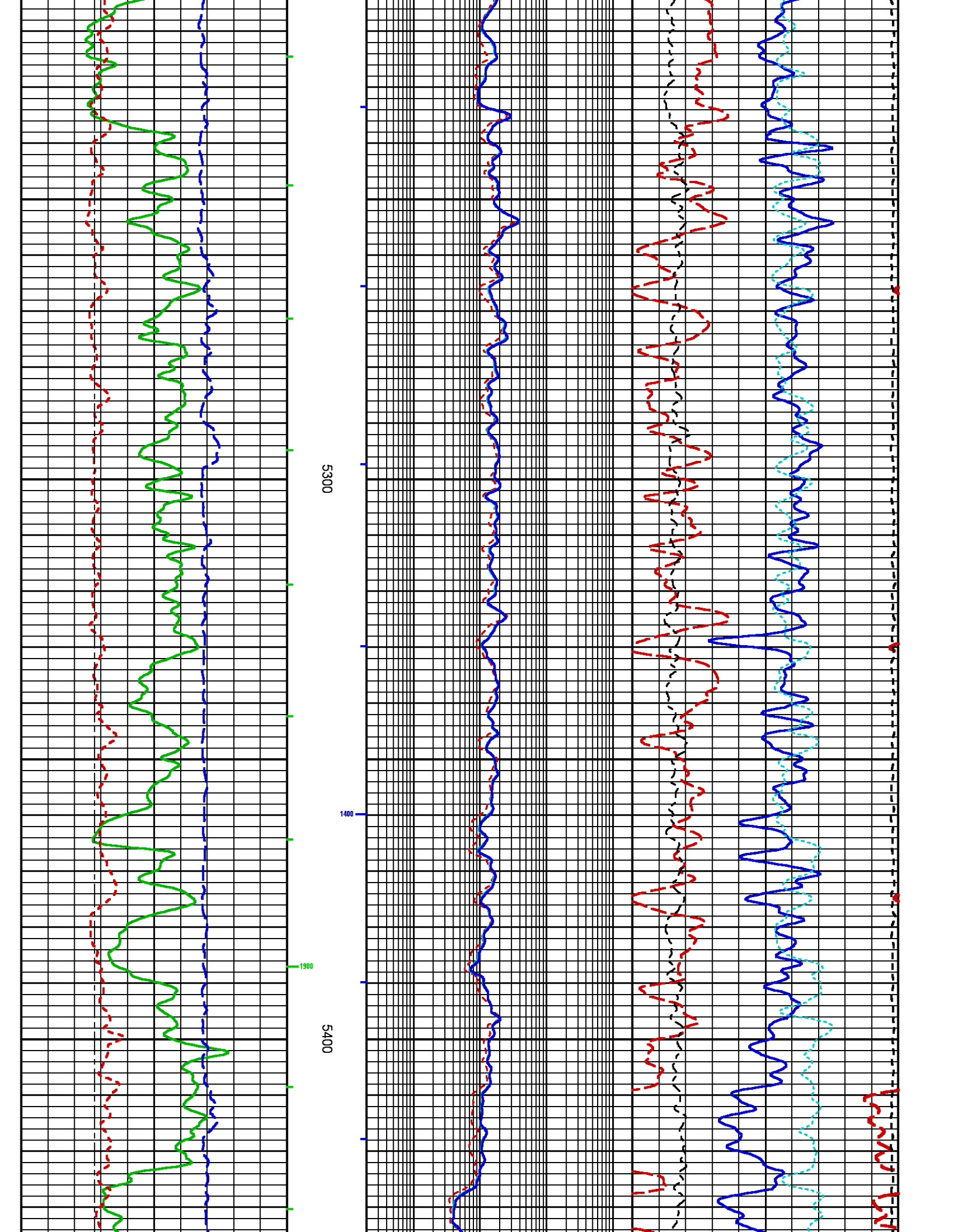


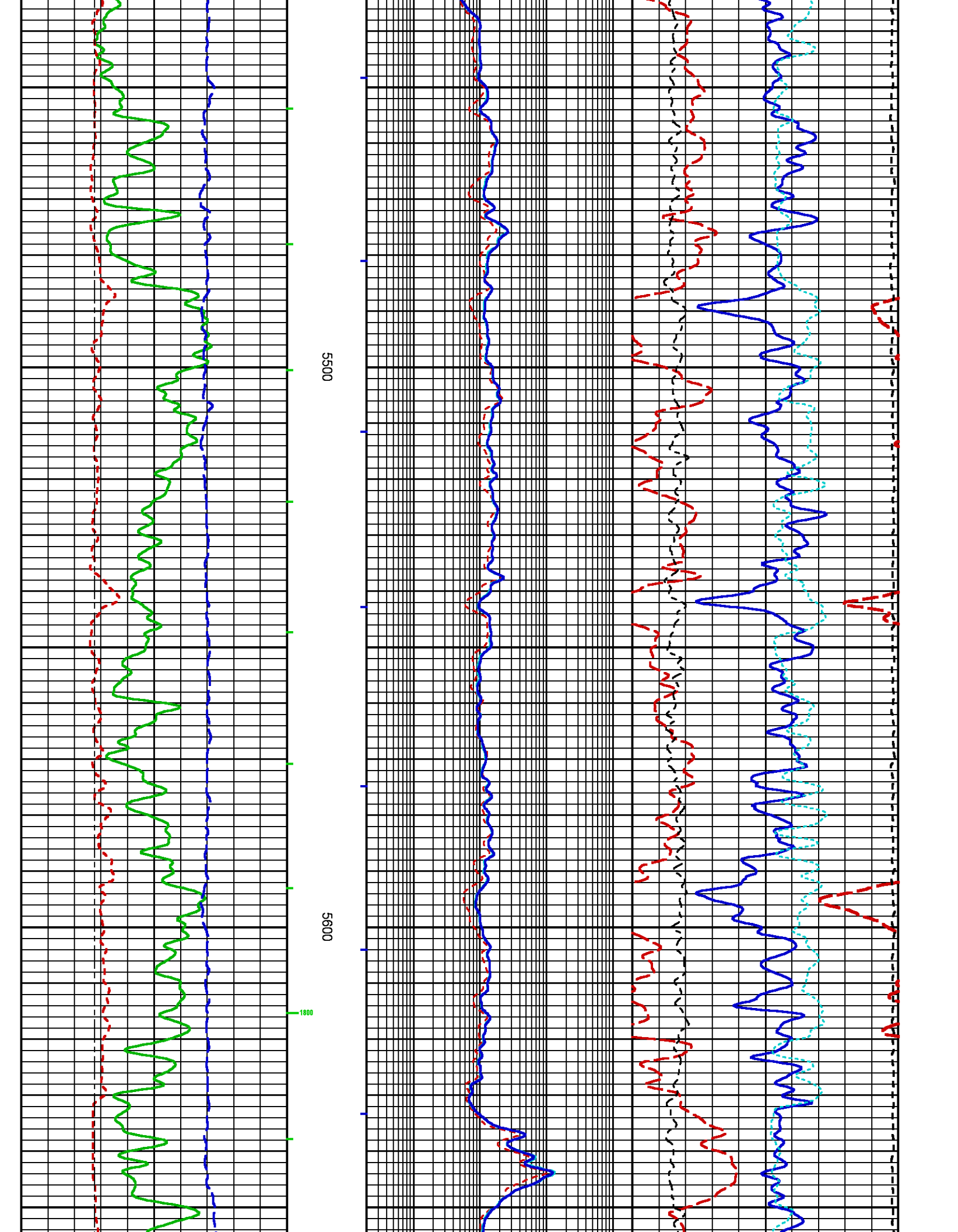


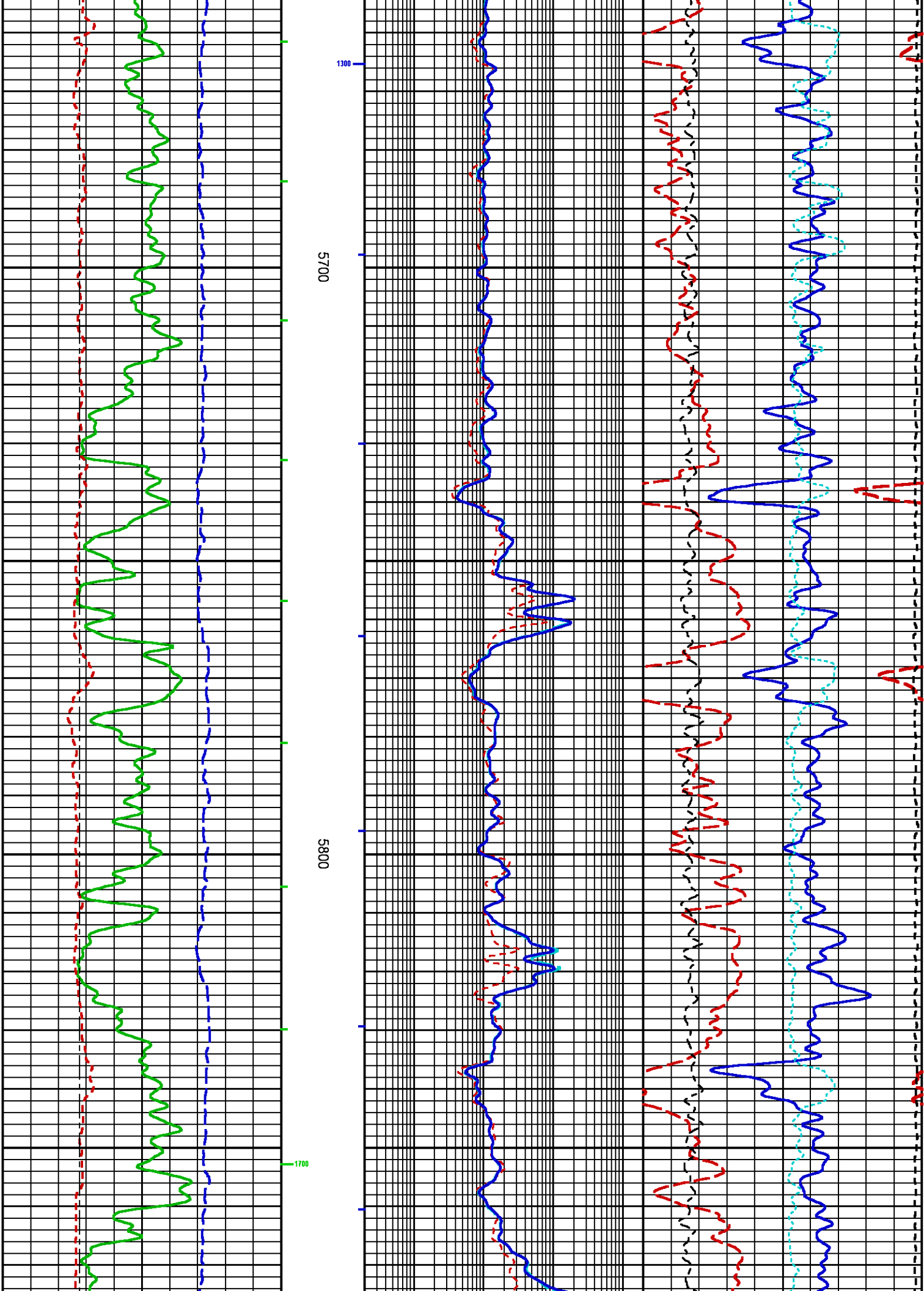


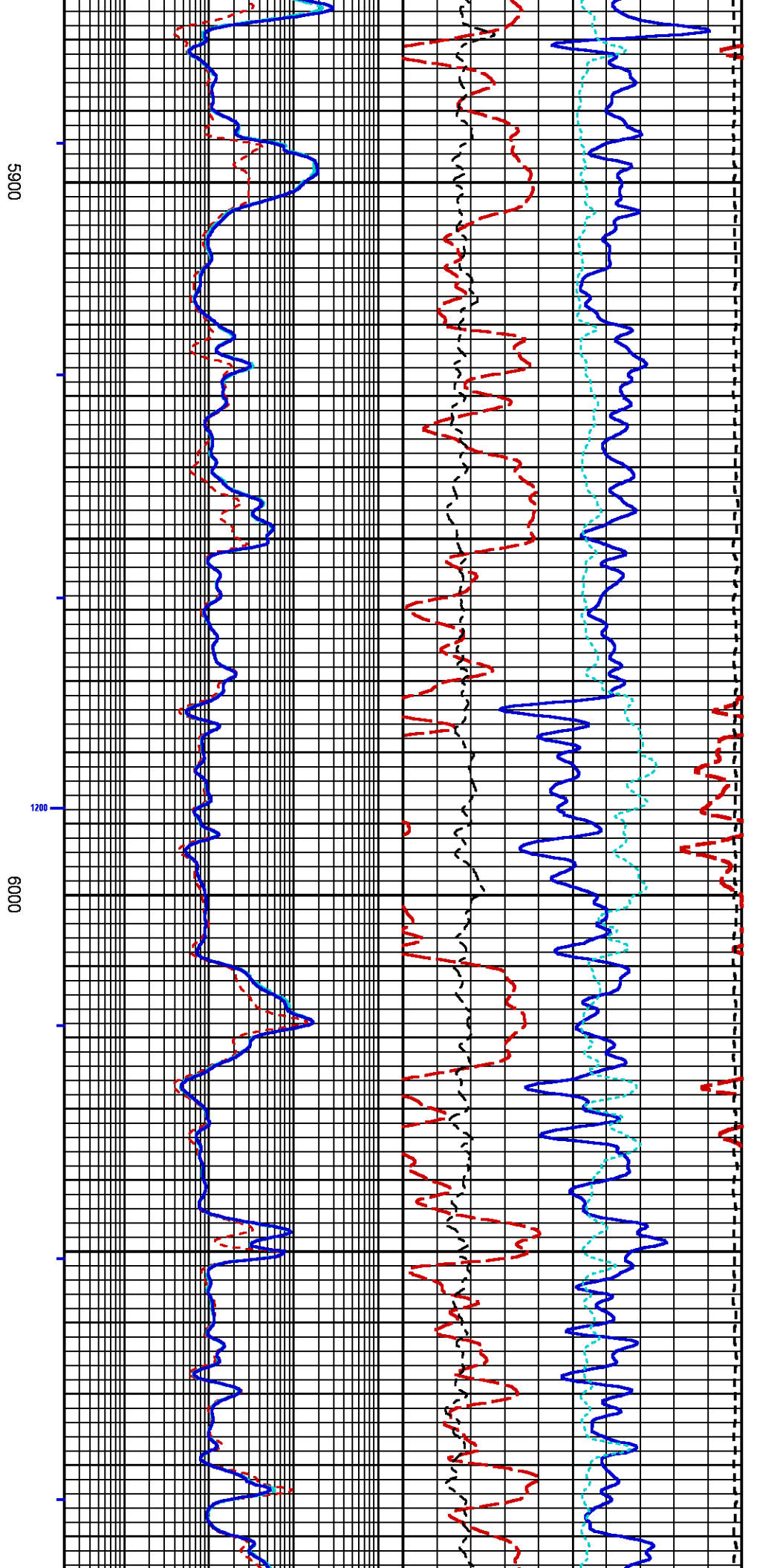
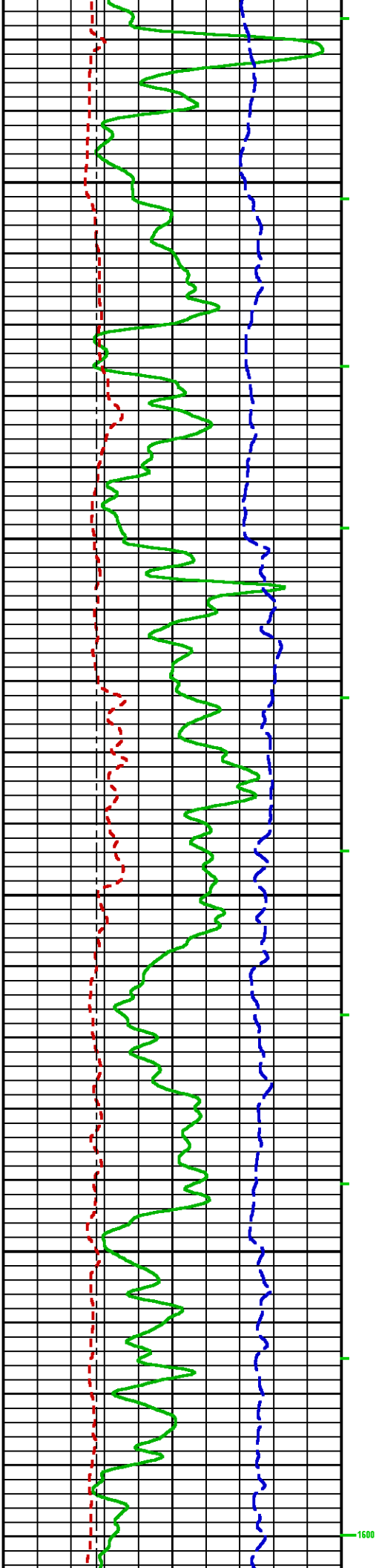


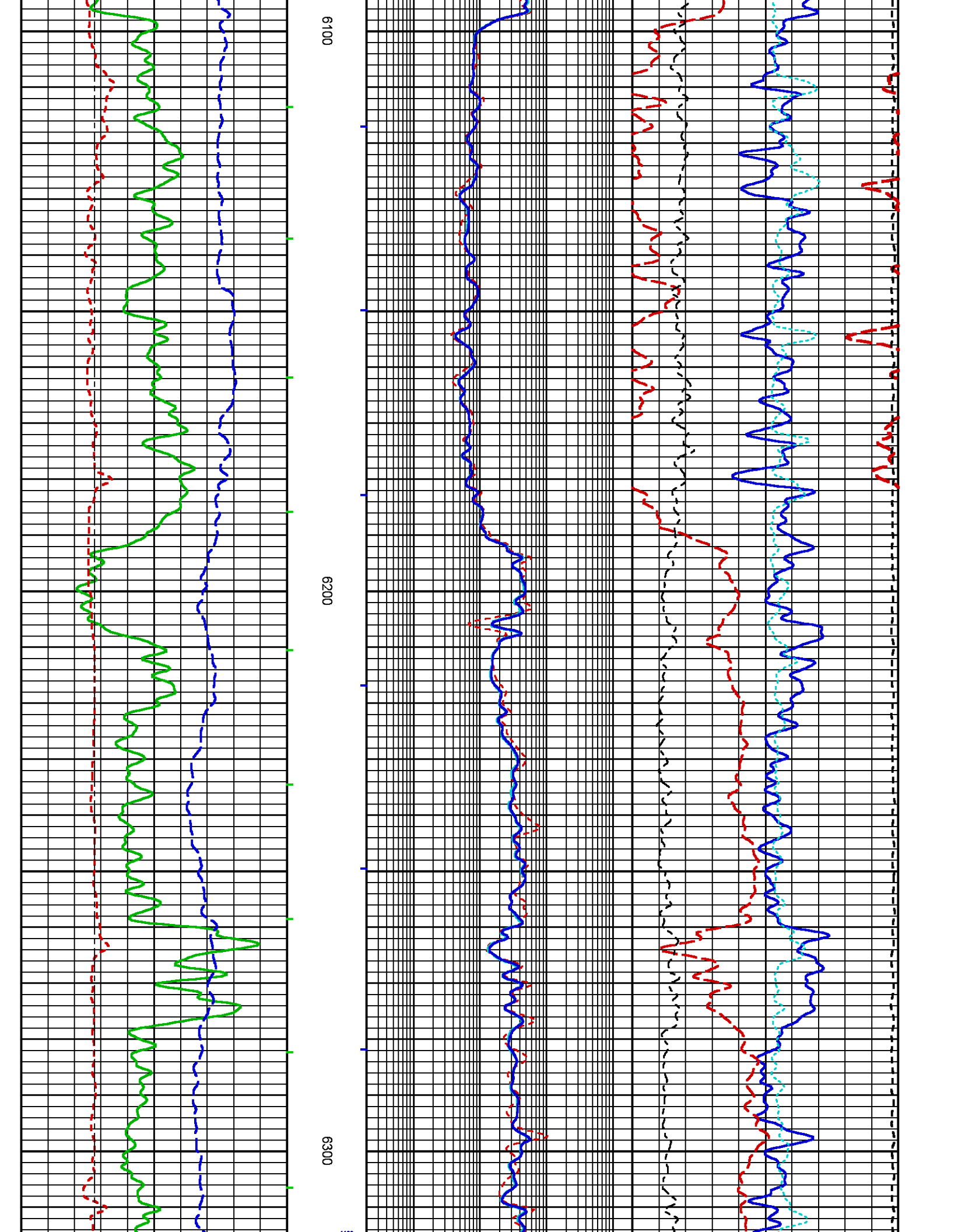


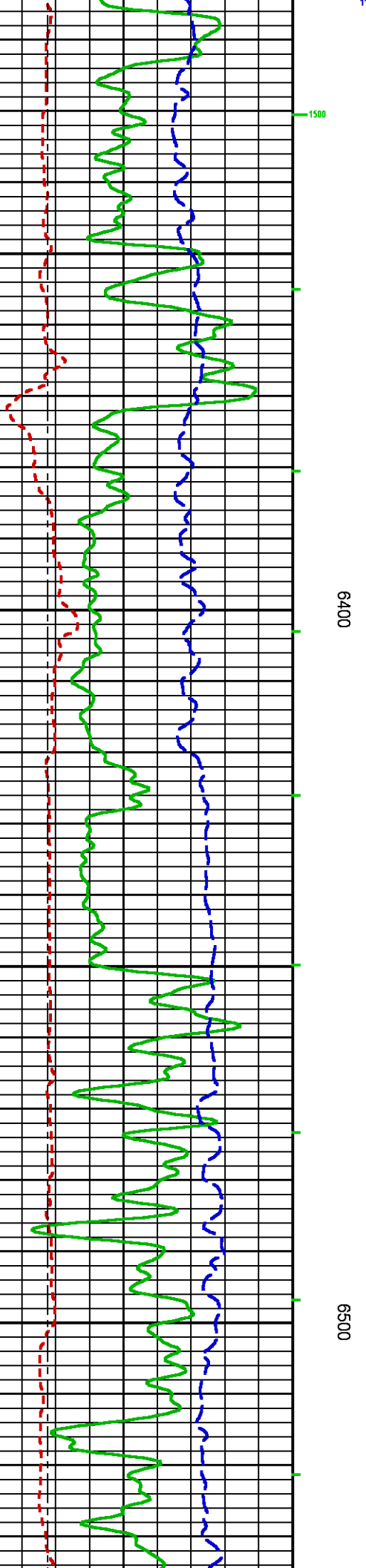
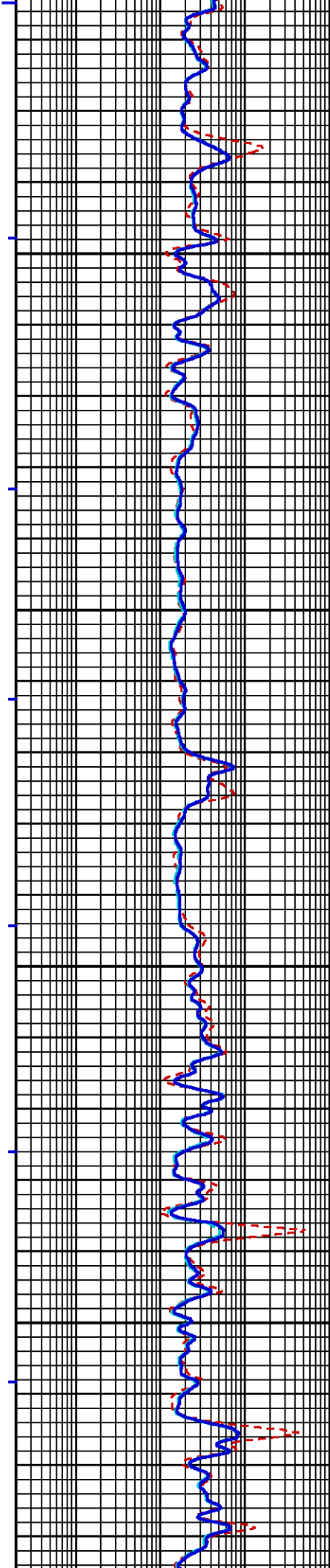
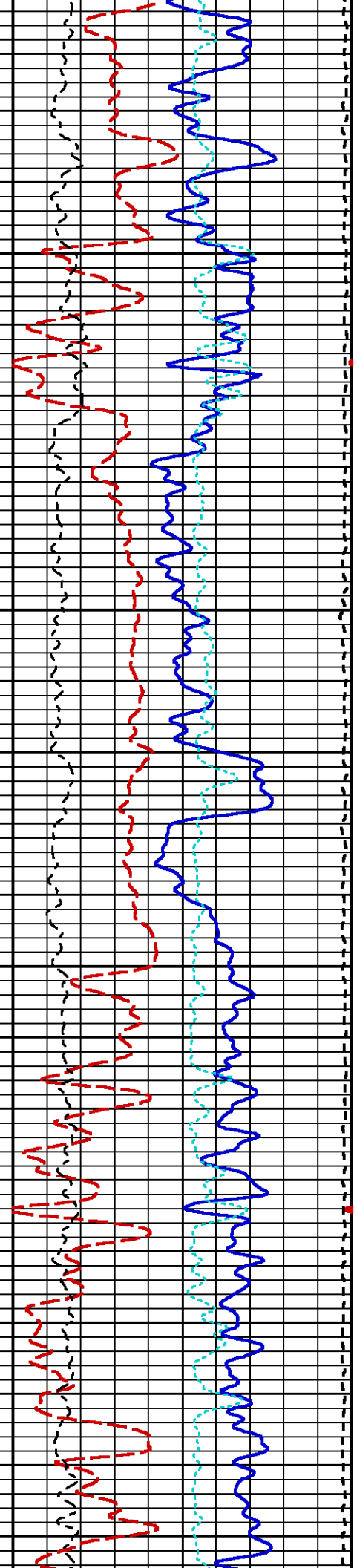


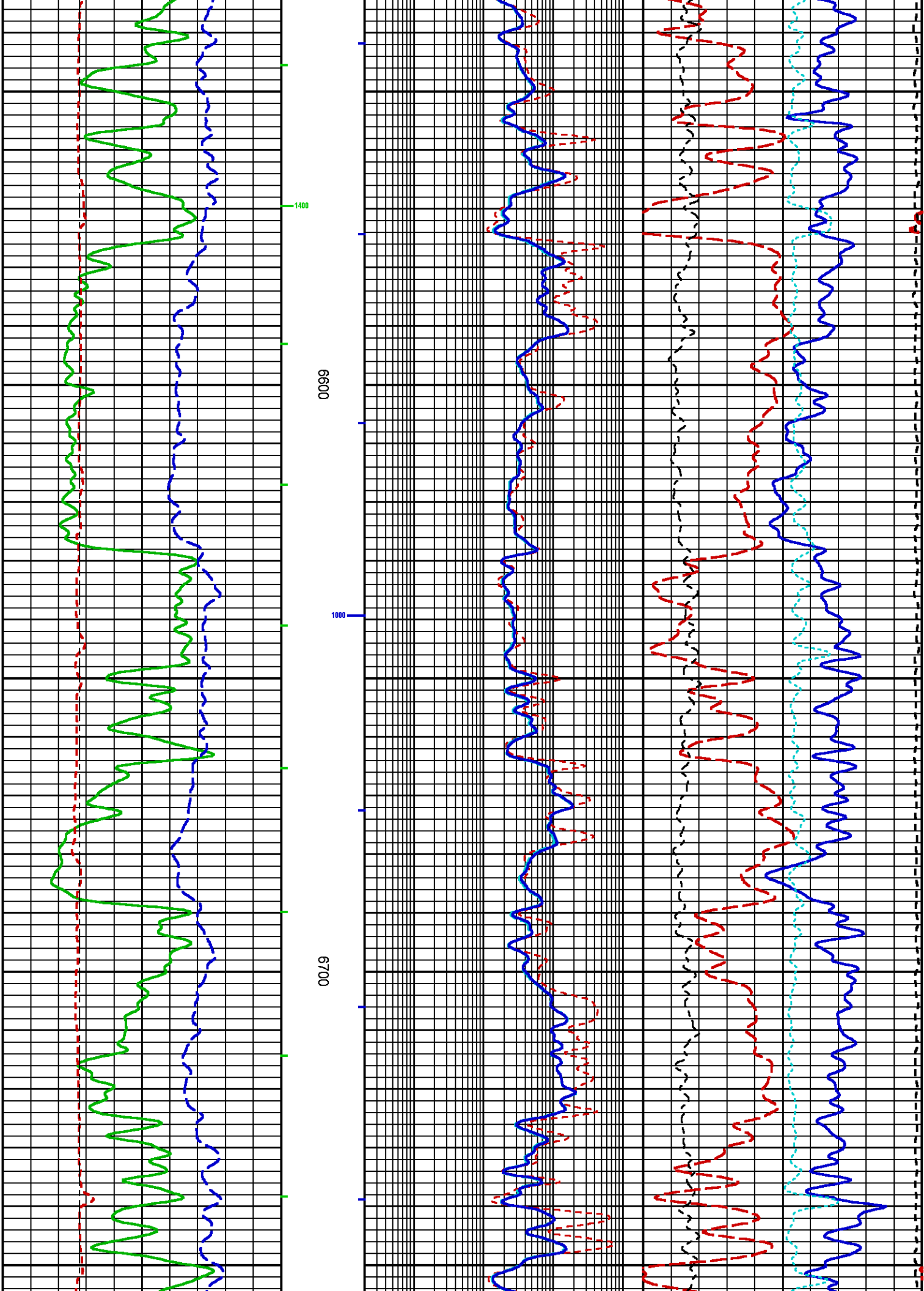


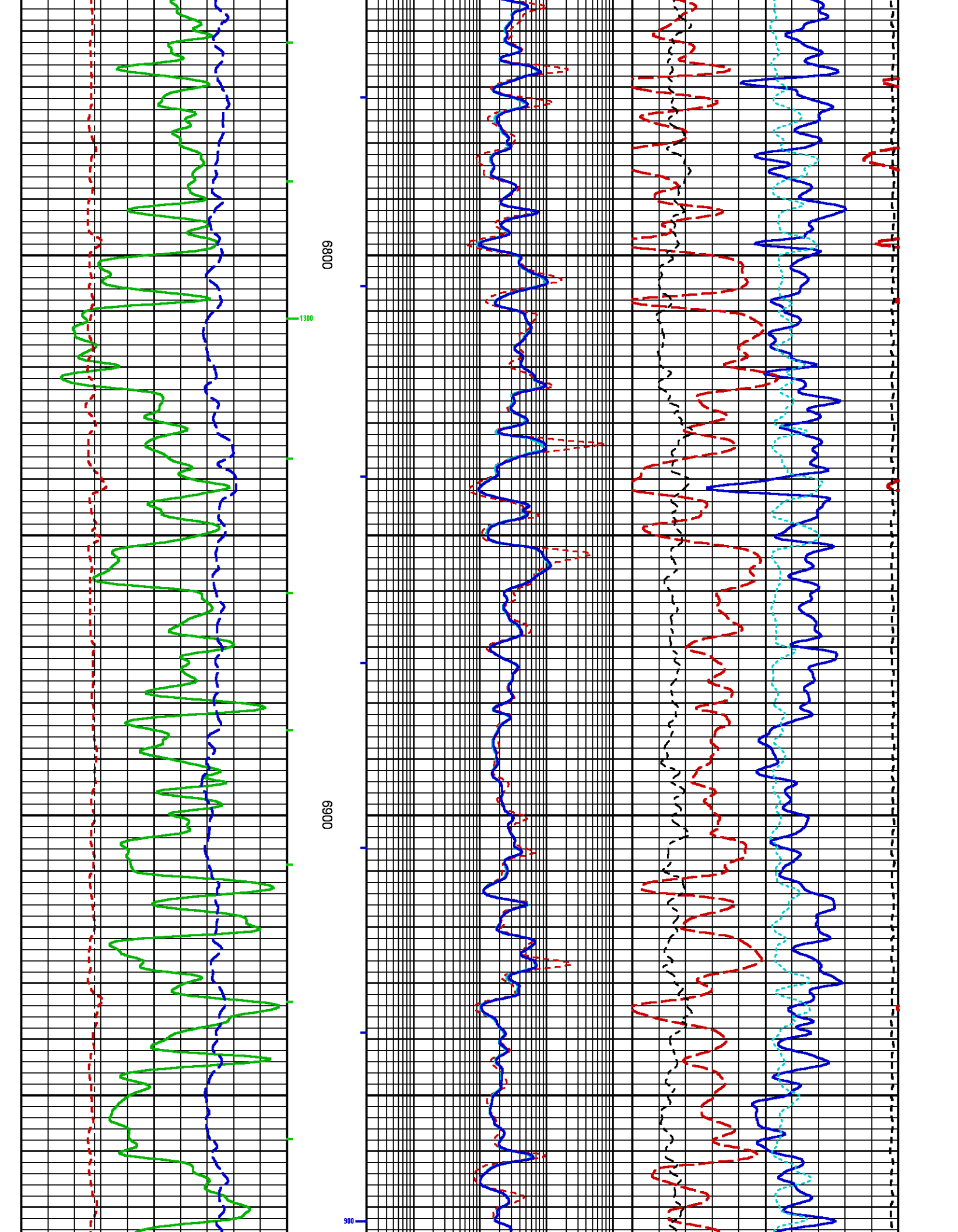


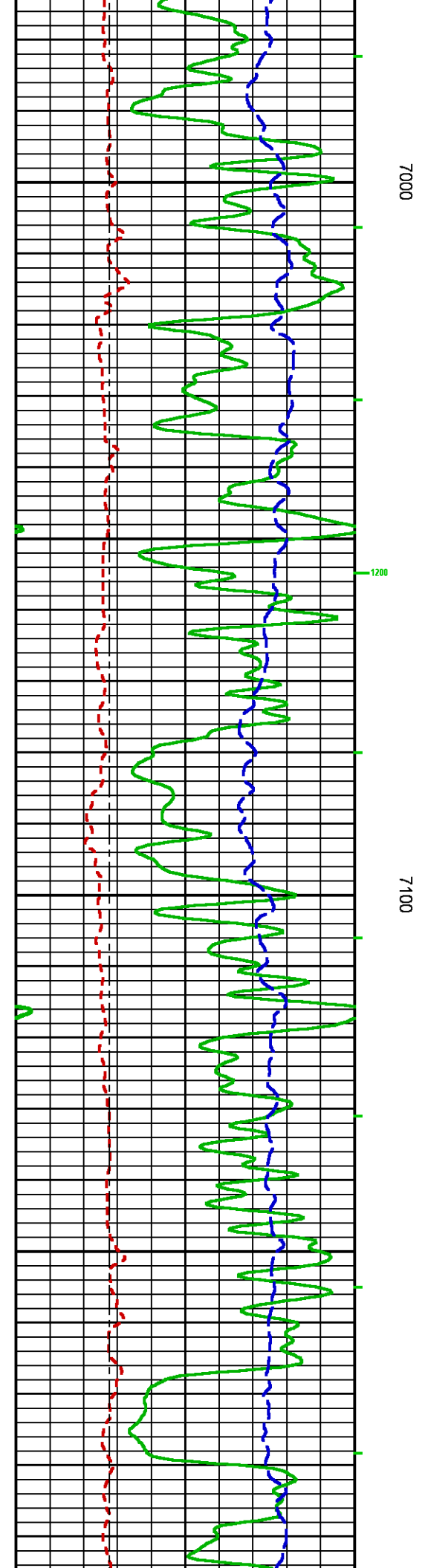
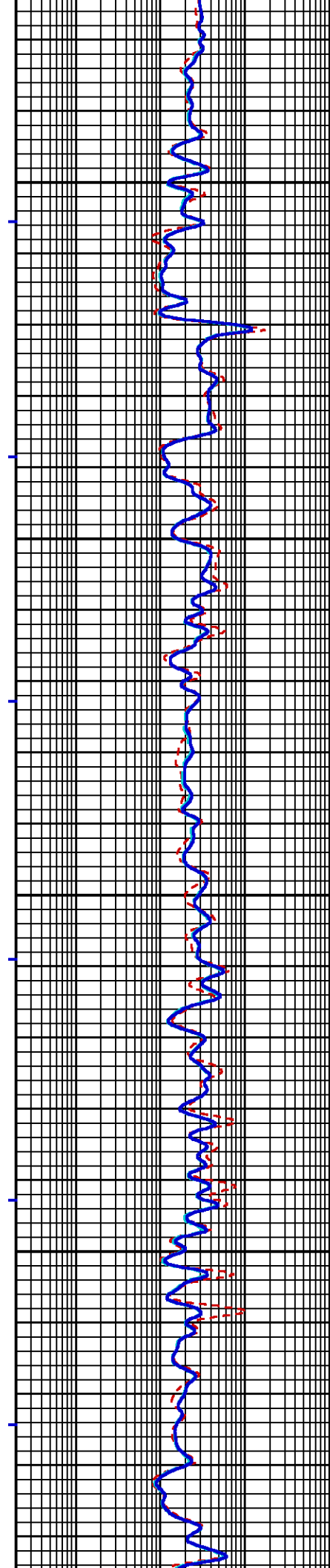
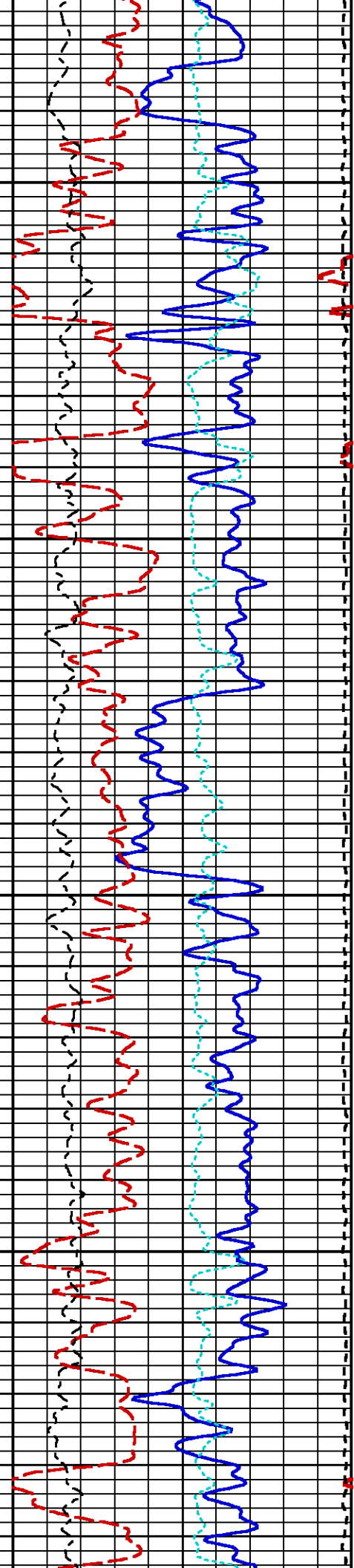


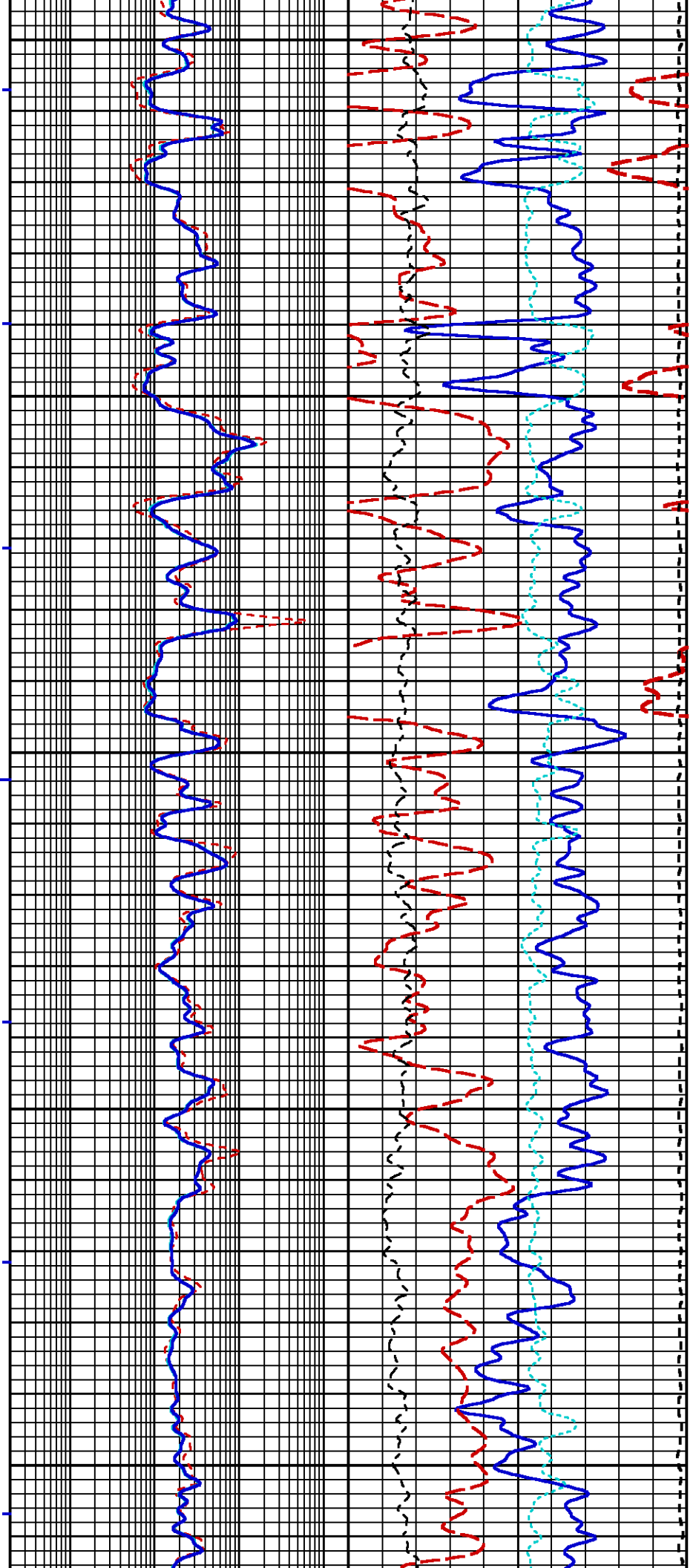












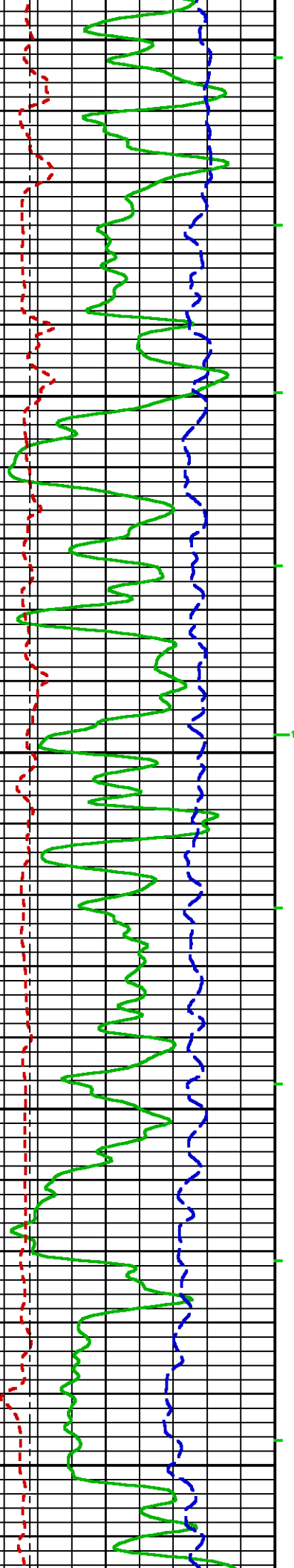
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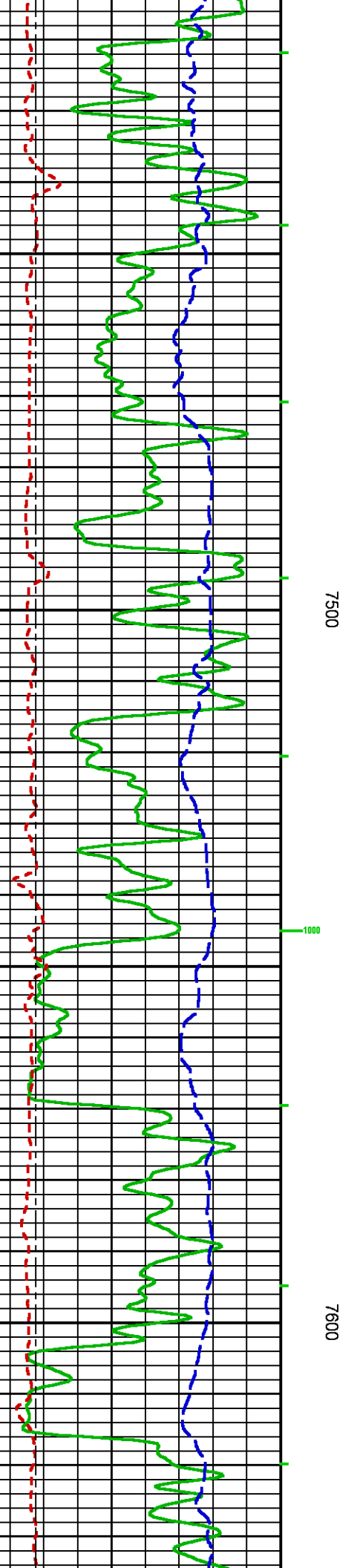
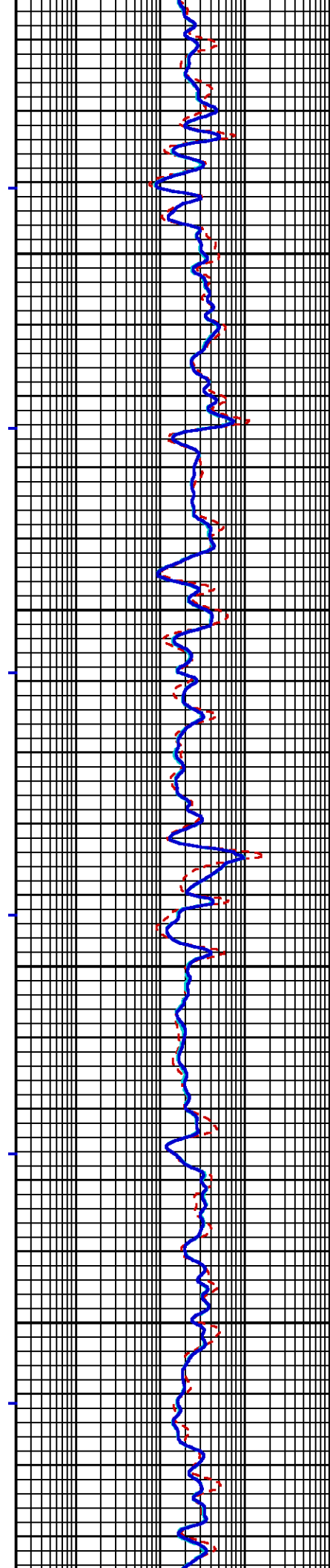
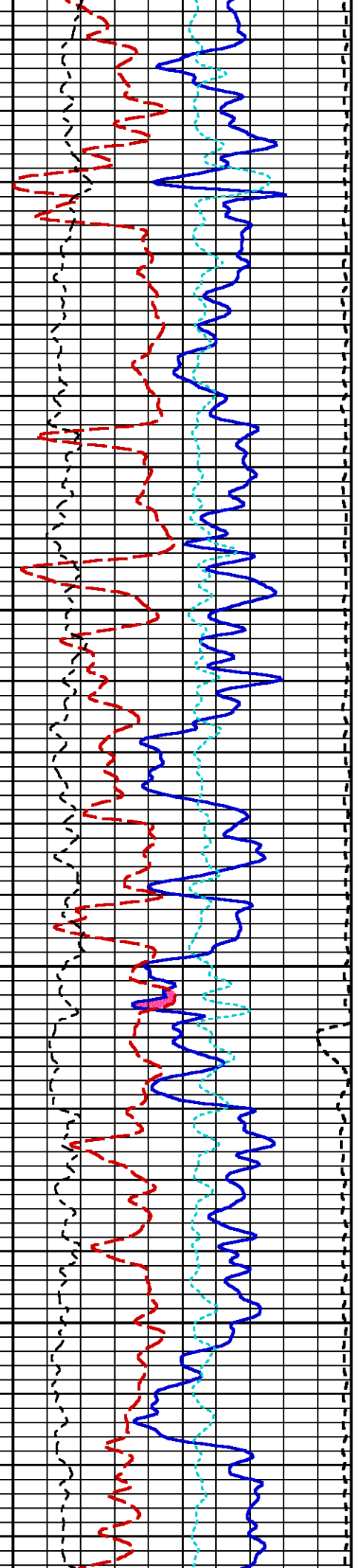
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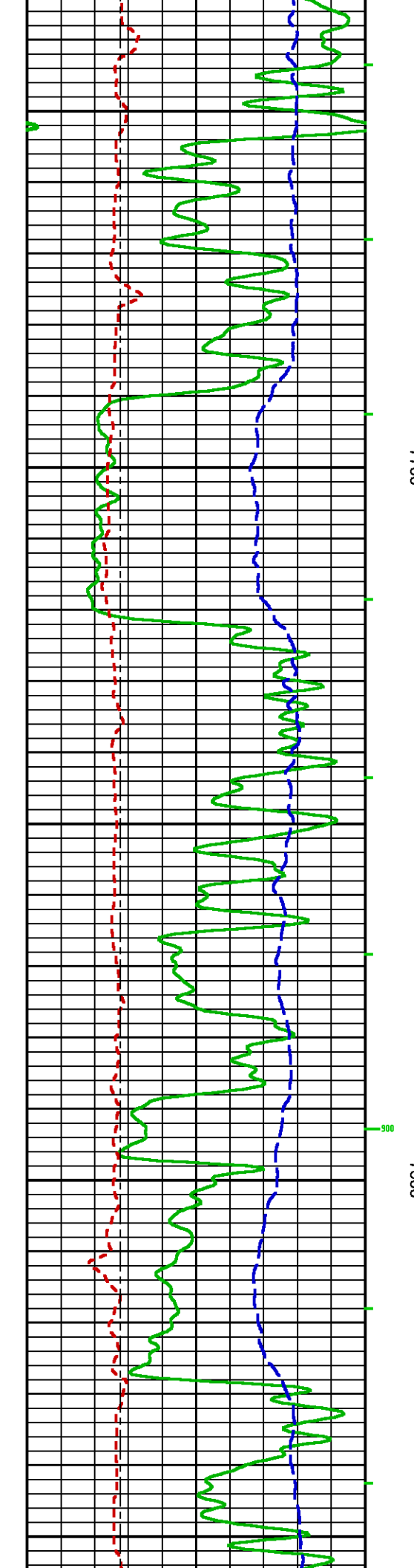
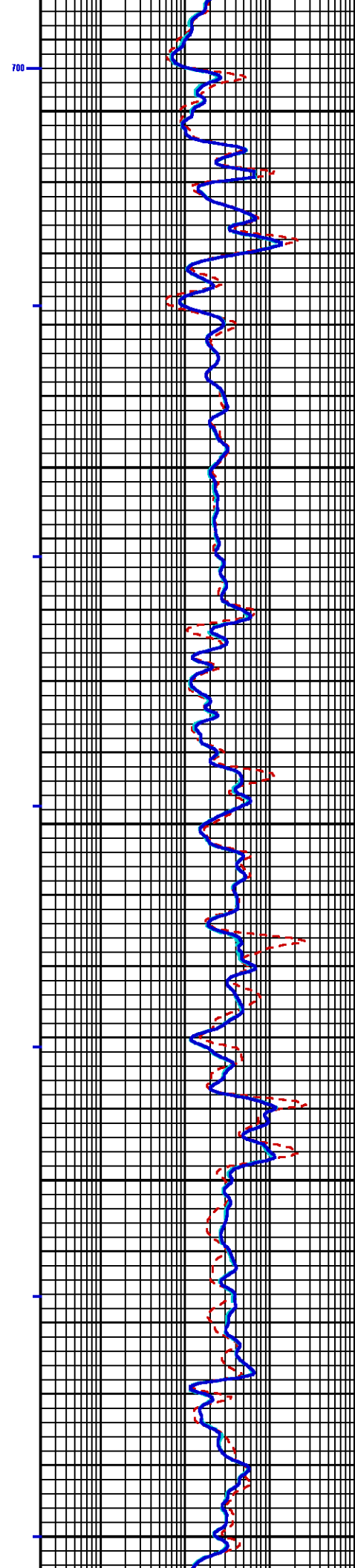
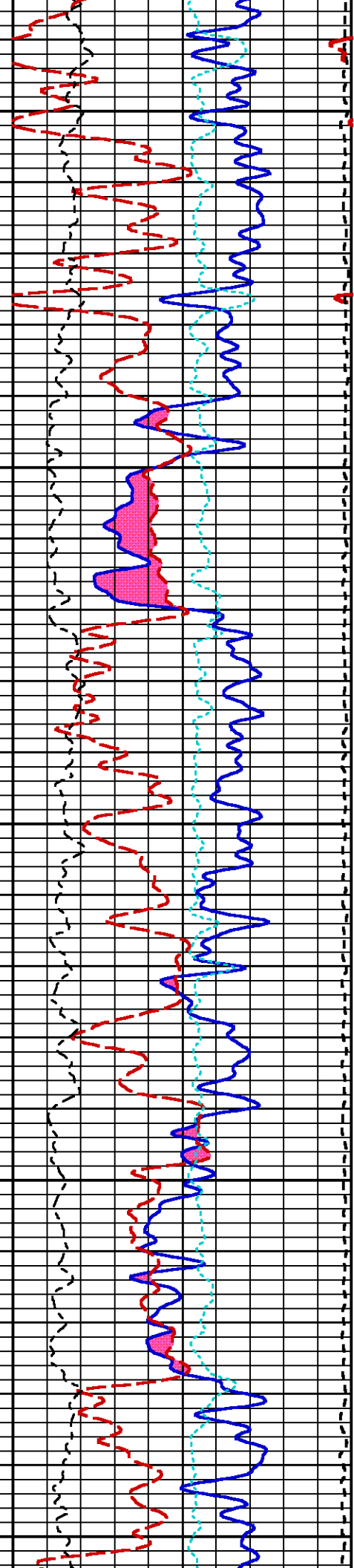
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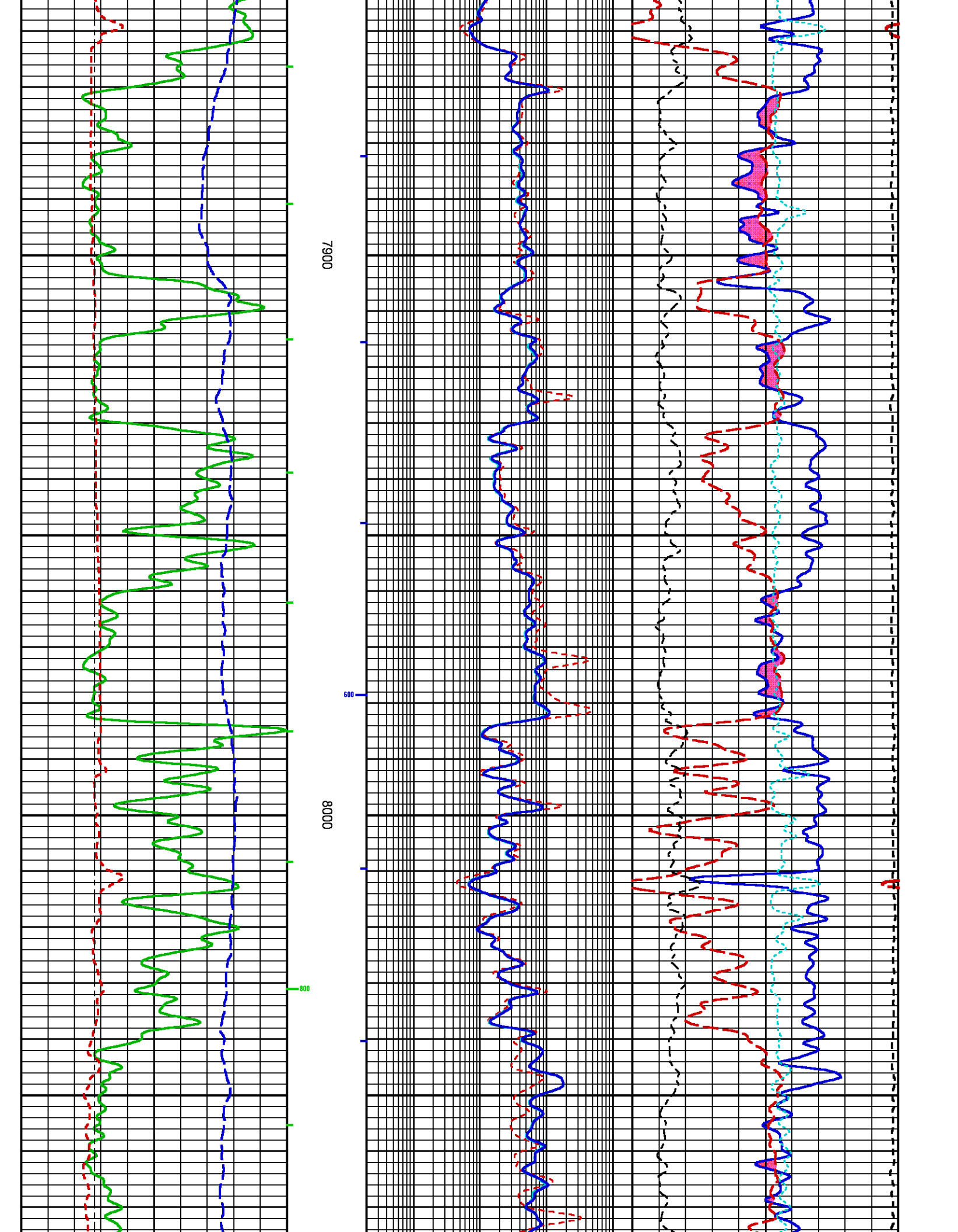
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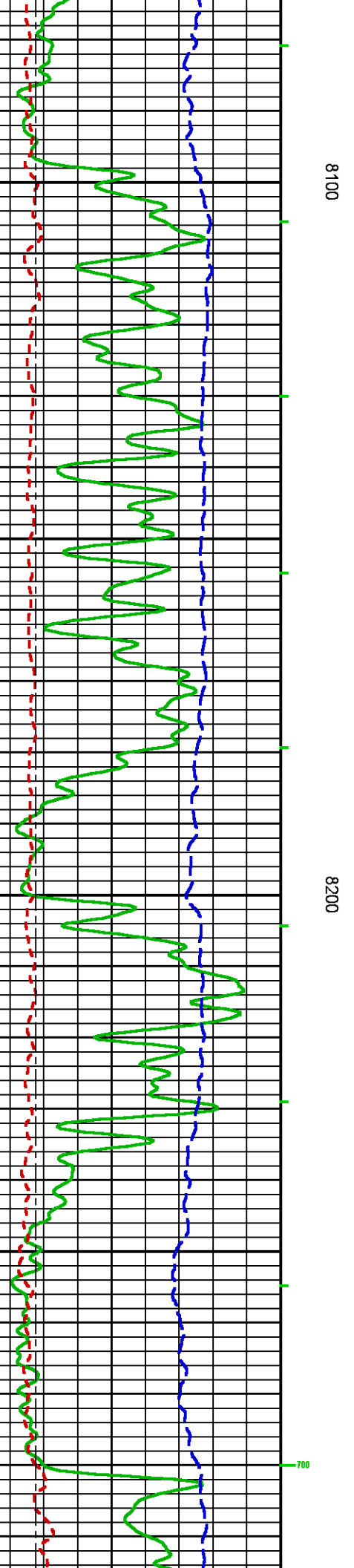
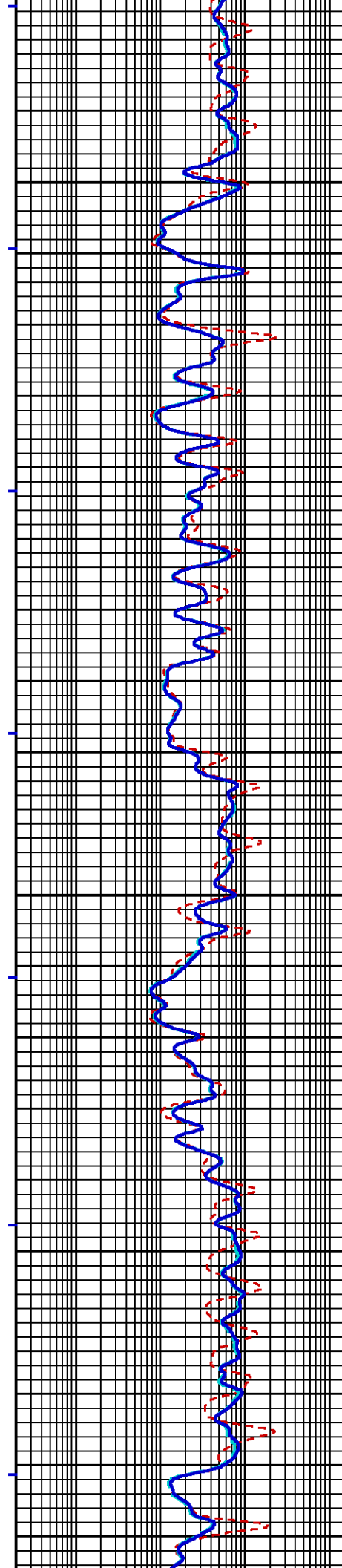
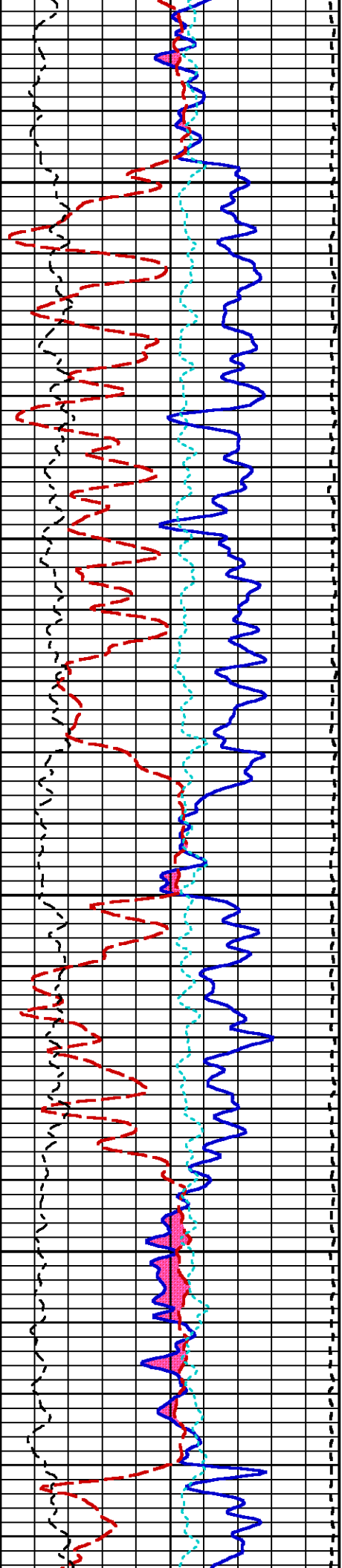
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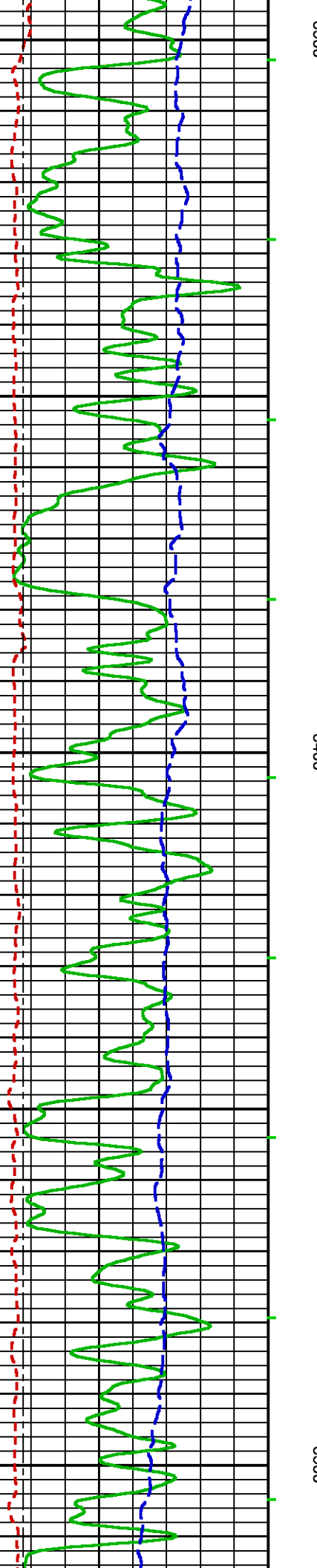
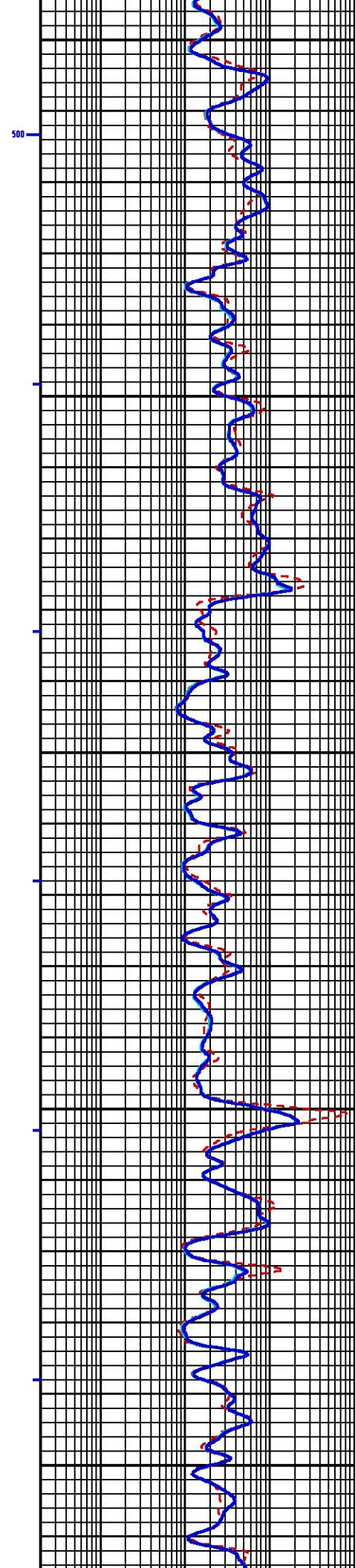
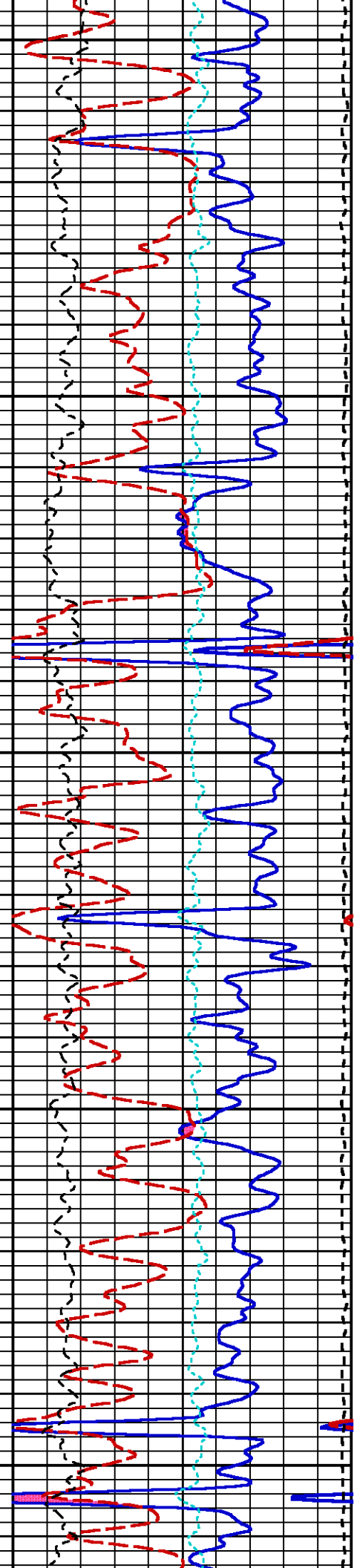


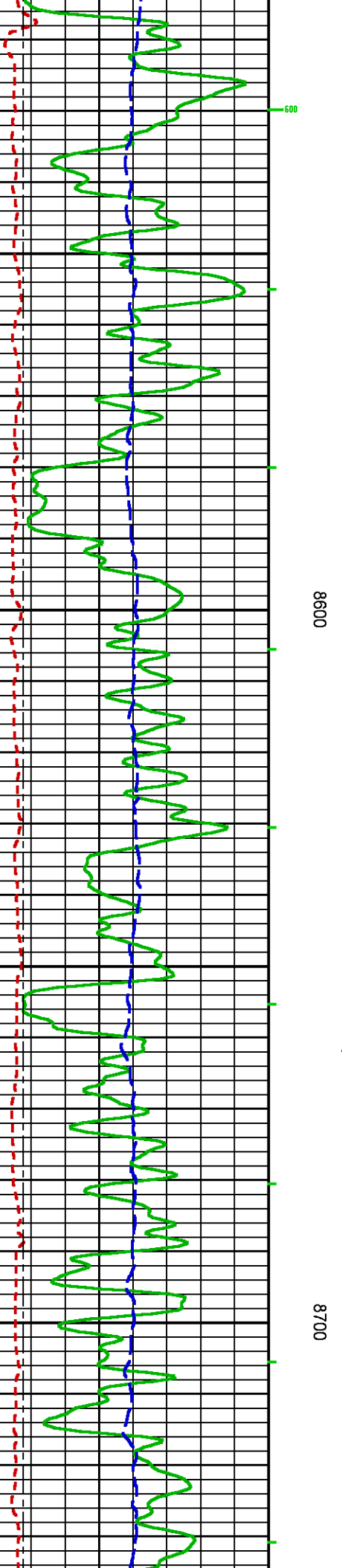
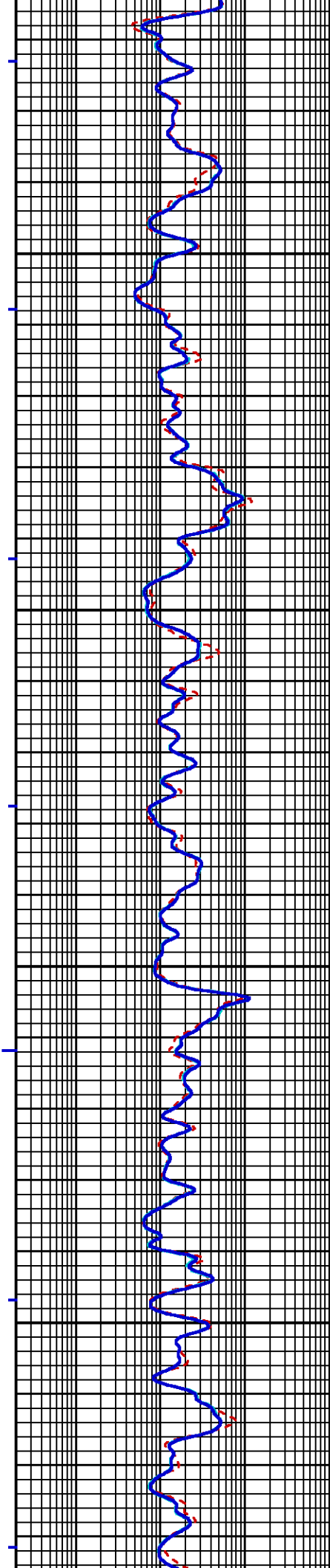
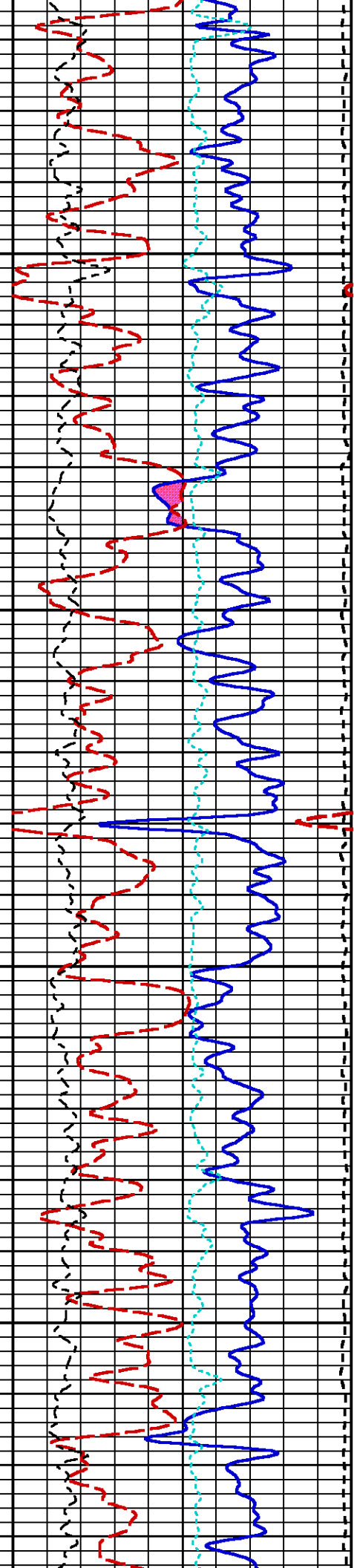


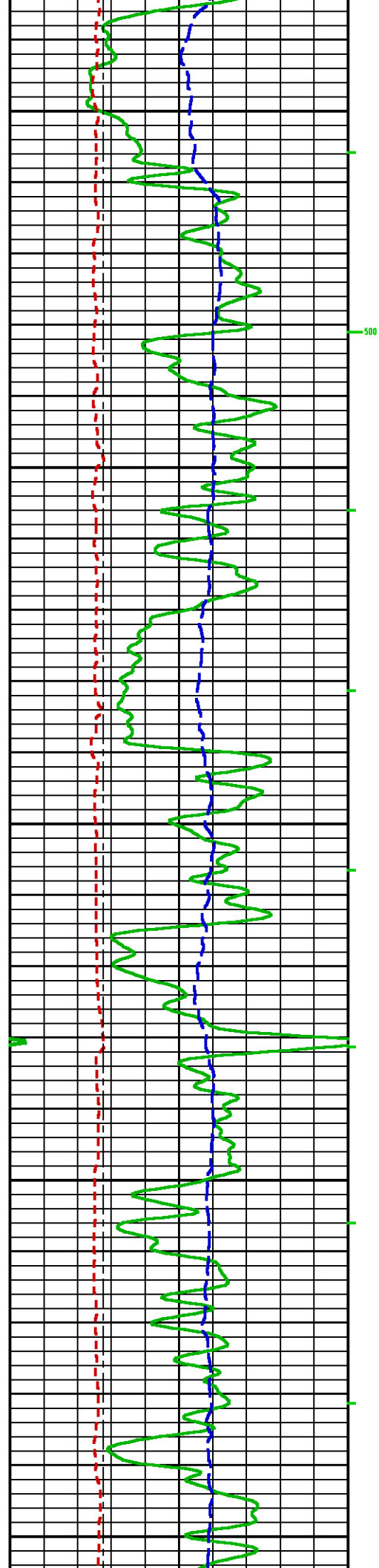






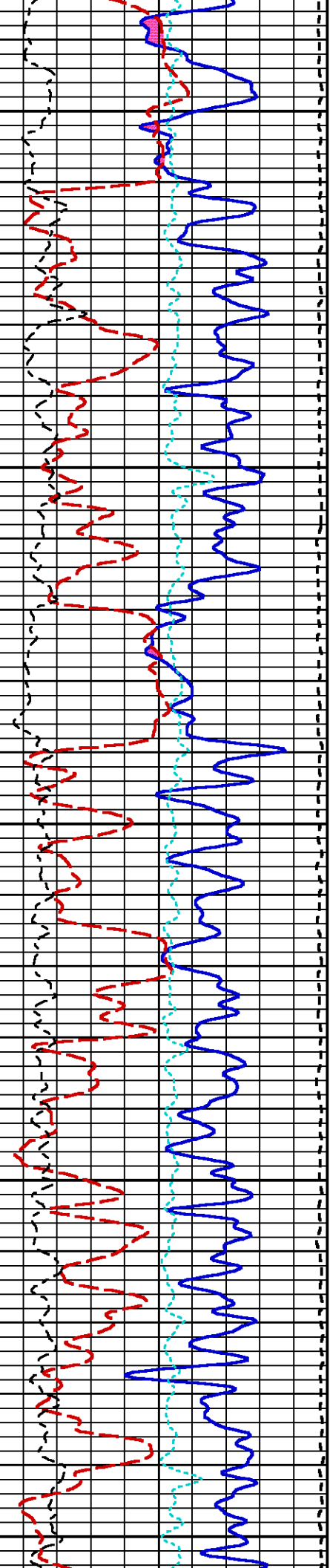
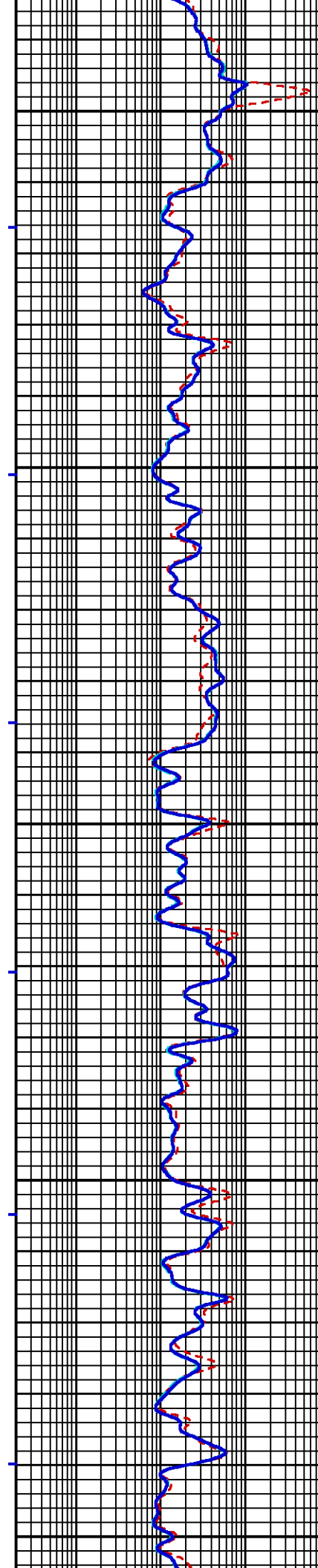


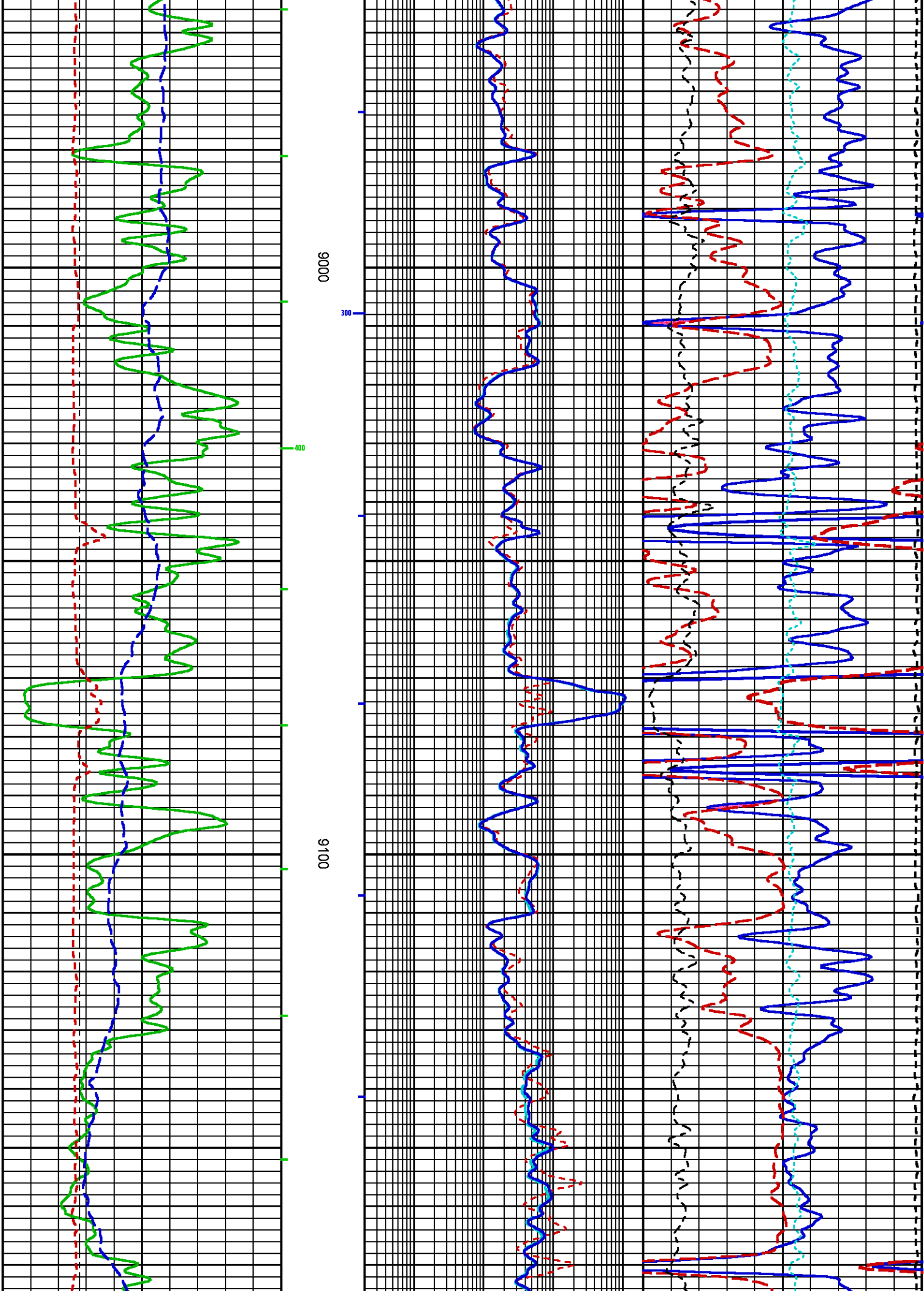


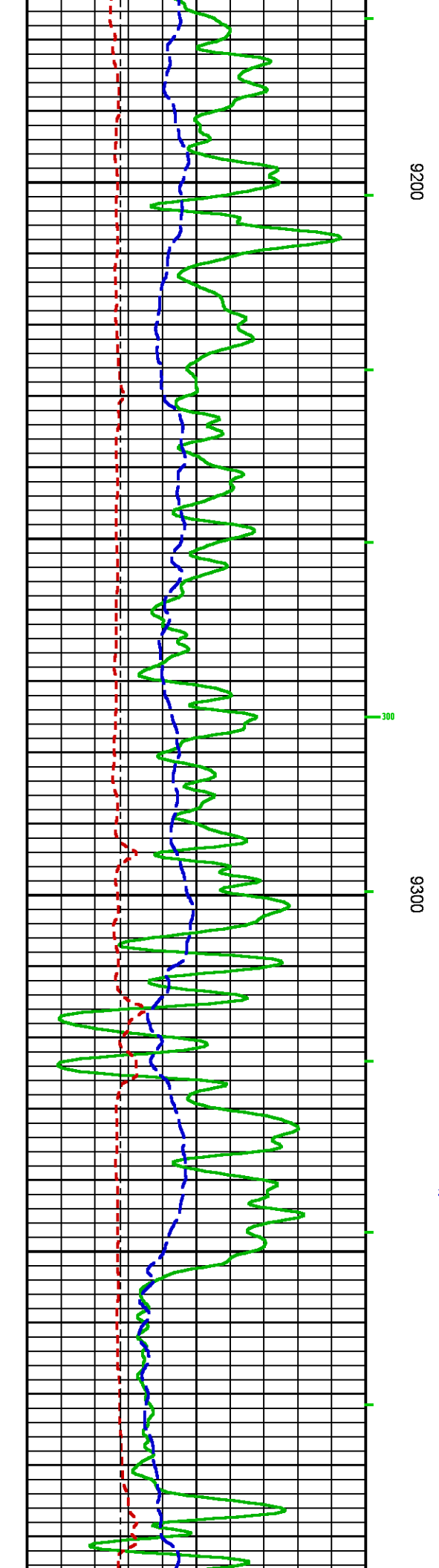
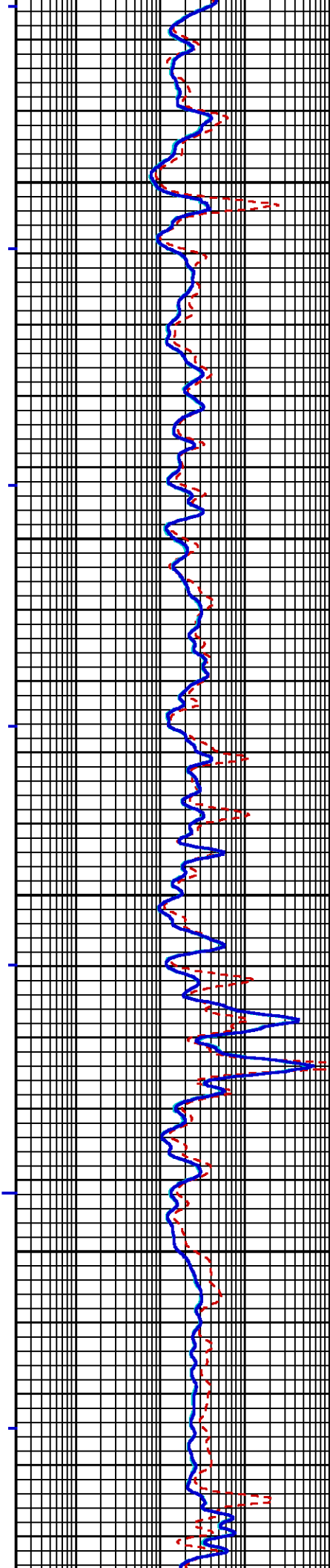
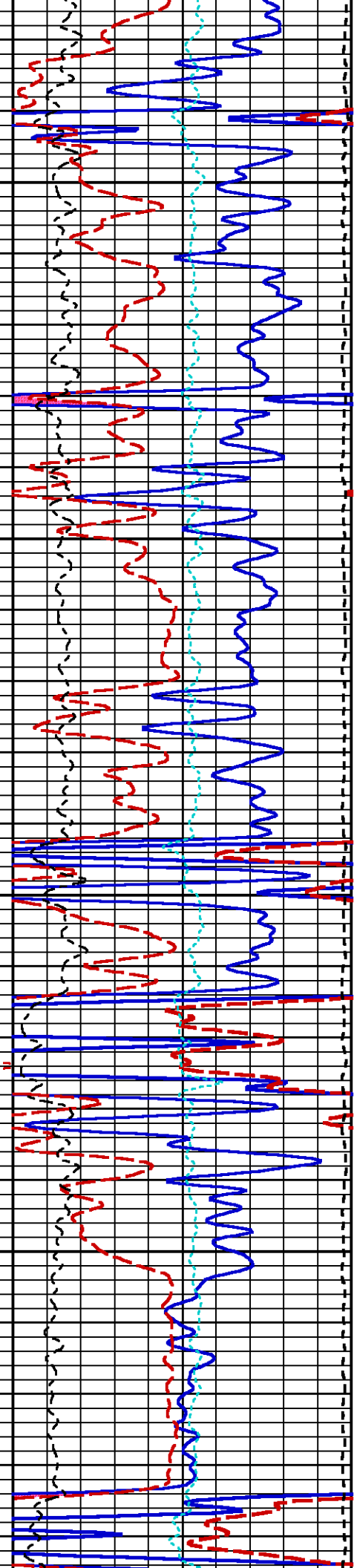


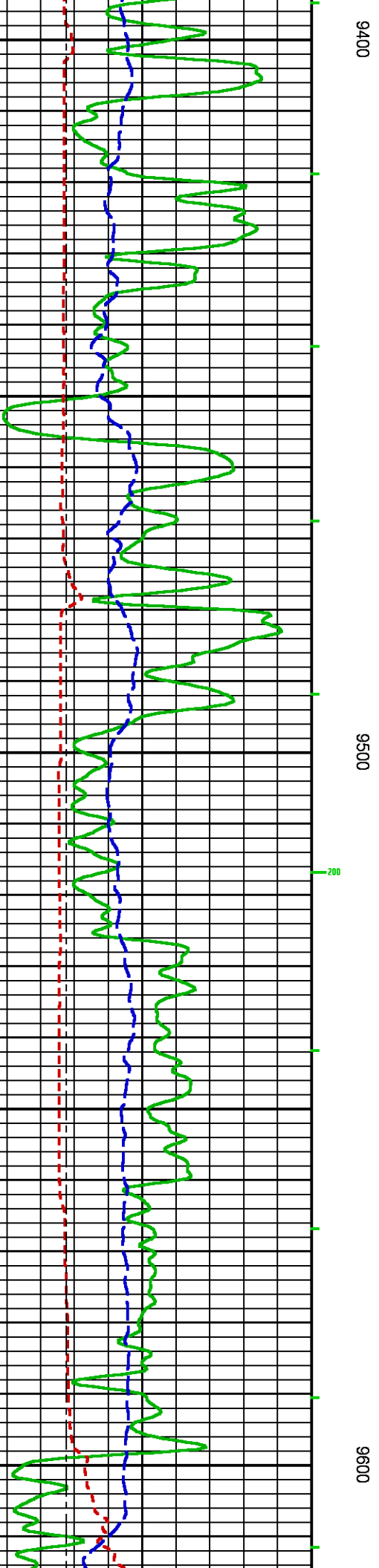
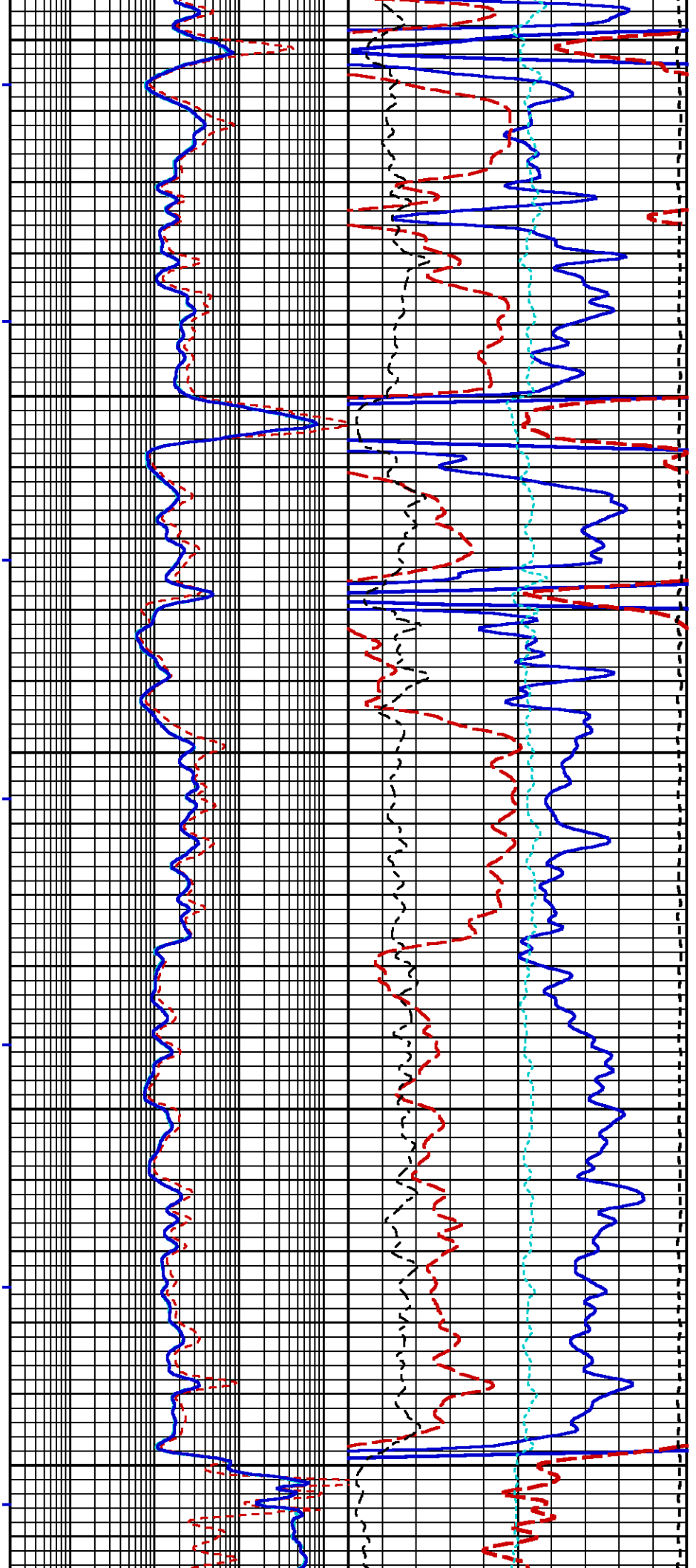
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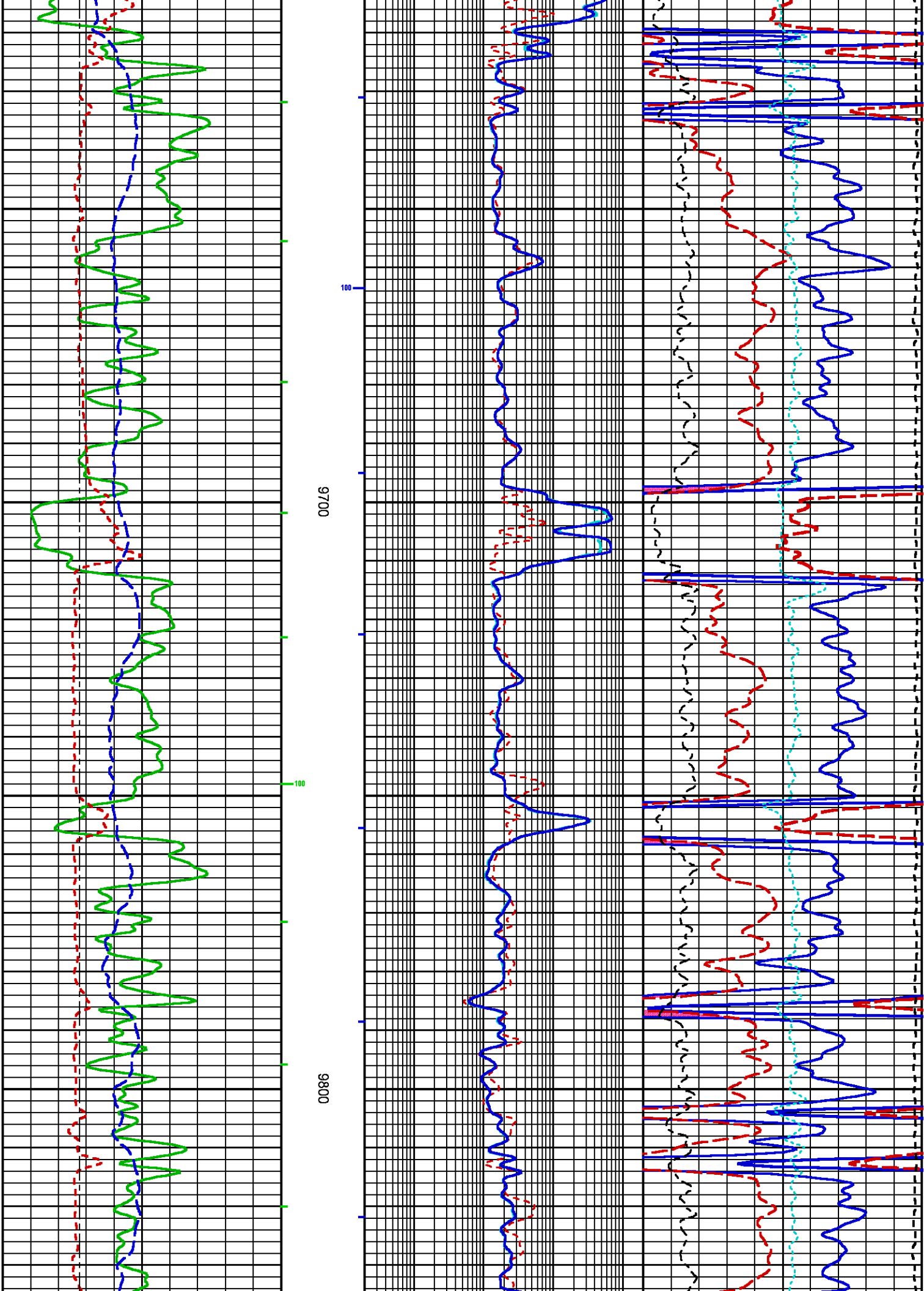
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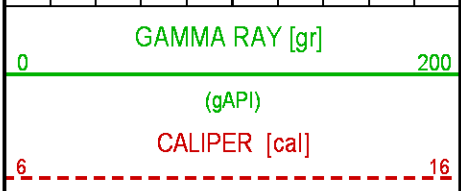
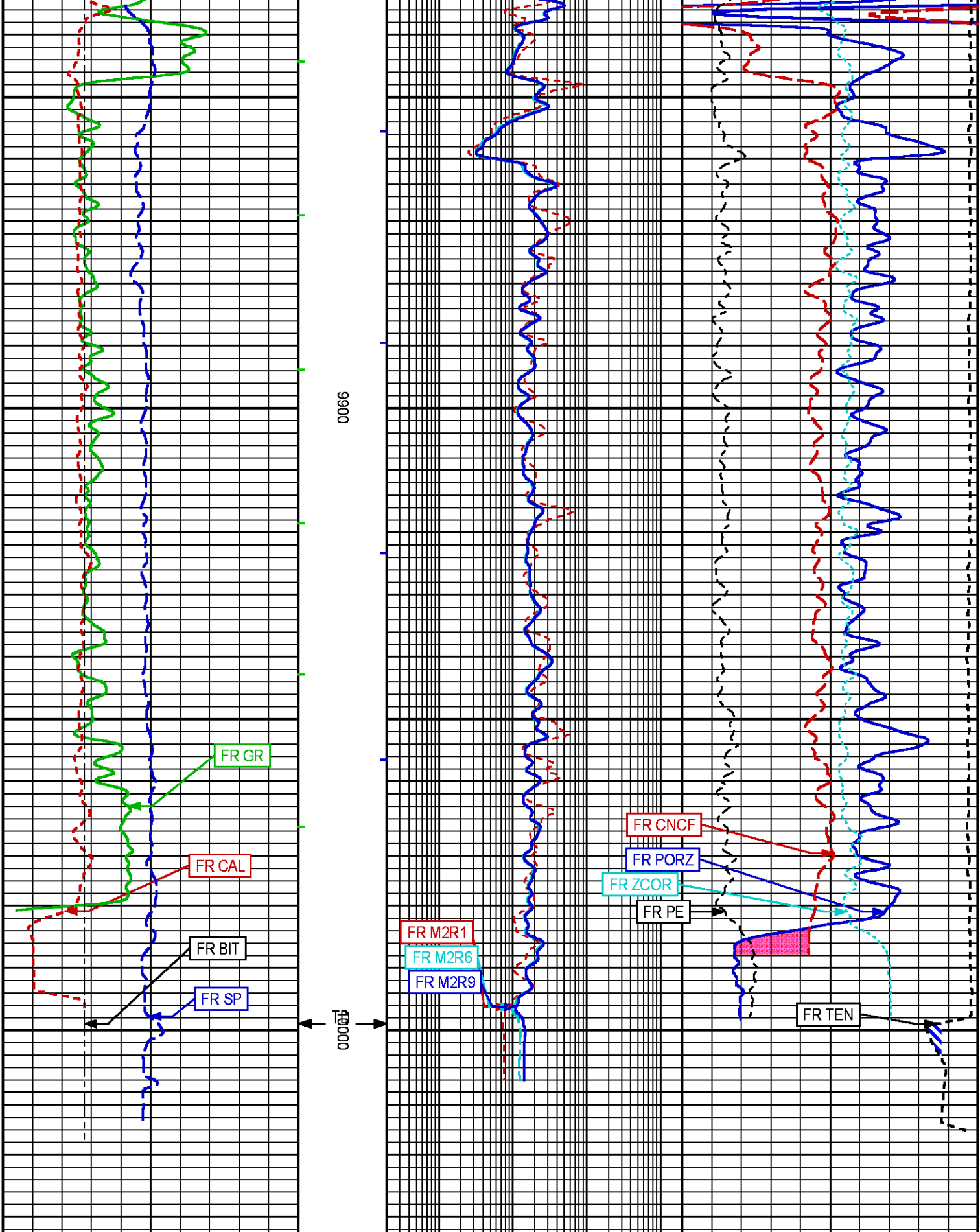




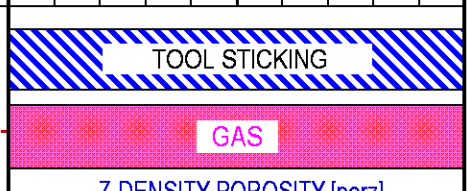
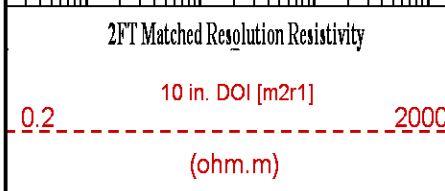


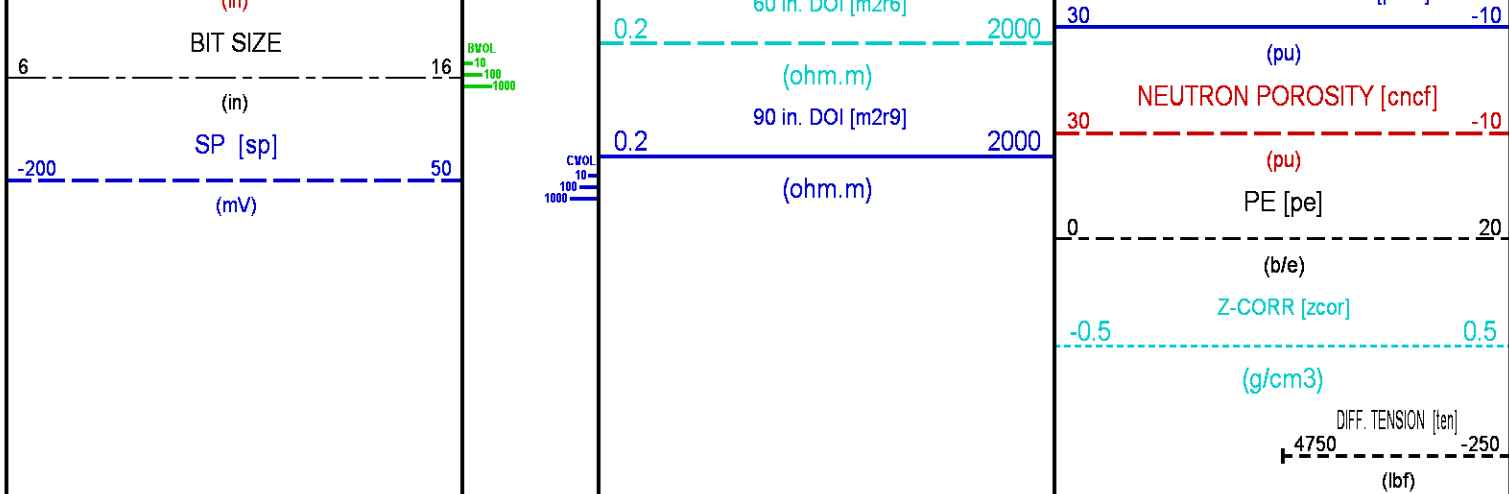






9900  
FEET





## REPEAT LOG 5"/100FT SCALE

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013

Updates: 1 Patches: 8

Plotted: Wed Nov 25 18:39:53 2015

### PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/OH101021/n970aR01.prm  
 LOGGING MODE: DEPTH      DIRECTION: UP  
 TOP DEPTH: 1120.000 ft      BOTTOM DEPTH: 1541.280 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.	4.500	in	TOP	BOTTOM
	CASING THICKNESS	0.000	in	"	"
BIT SIZE	BIT SIZE	8.750	in	"	"
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (mbh*)	USE CALIPER		"	"
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	8.750	in	"	"
	FIXED DIAMETER (mbh*)	8.750	in	"	"
BH MUD RESISTIVITY SOURCE	RMUD SOURCE (HDIL)	TOOL MEASURED		"	"
MUD SAMPLE RESISTIVITY	MUD SAMPLE TEMP	59.5	degF	"	"
	MUD SAMPLE RES	0.680	ohm.m	"	"
BOREHOLE TEMP from GRADIENT	Known BH REF TEMP	59.5	degF	"	"
	at BH REF DEPTH	0.0	ft	"	"
	with TEMP GRADIENT	1.200	0.01 degF/ft	"	"

#### ACCELERATION PROCESSING

## 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	3100	ppm	"	"
	BOREHOLE CORRECTION	ON		"	"
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)	
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	in	"	"
	TOOL POSITION	ECCENTERED		"	"
	Rmud MULTIPLIER	1.000		"	"

## CURVE DESCRIPTION REPORT

CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BIT	Nov 25 01:13:06 2015	BIT SIZE
F1:BVOL	Nov 25 01:13:06 2015	BOREHOLE VOLUME
F1:CAL	Nov 25 01:13:06 2015	CALIPER
F1:CNCF	Nov 25 01:13:06 2015	FIELD NORMALIZED COMPENSATED NEUTRON POROSITY
F1:CVOL	Nov 25 01:13:06 2015	CEMENT VOLUME
F1:GR	Nov 25 01:13:06 2015	GAMMA RAY
F1:M2R1	Nov 25 01:13:06 2015	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 10-INCH DOI
F1:M2R6	Nov 25 01:13:06 2015	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 60-INCH DOI
F1:M2R9	Nov 25 01:13:06 2015	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 90-INCH DOI
F1:PE	Nov 25 01:13:06 2015	PHOTO ELECTRIC CROSS-SECTION
F1:PORZ	Nov 25 01:13:06 2015	POROSITY FOR SELECTABLE MATRIX
F1:SP	Nov 25 01:13:06 2015	SPONTANEOUS POTENTIAL
F1:TEN	Nov 25 01:13:06 2015	DIFFERENTIAL TENSION
F1:ZCOR	Nov 25 01:13:06 2015	DENSITY CORRECTION

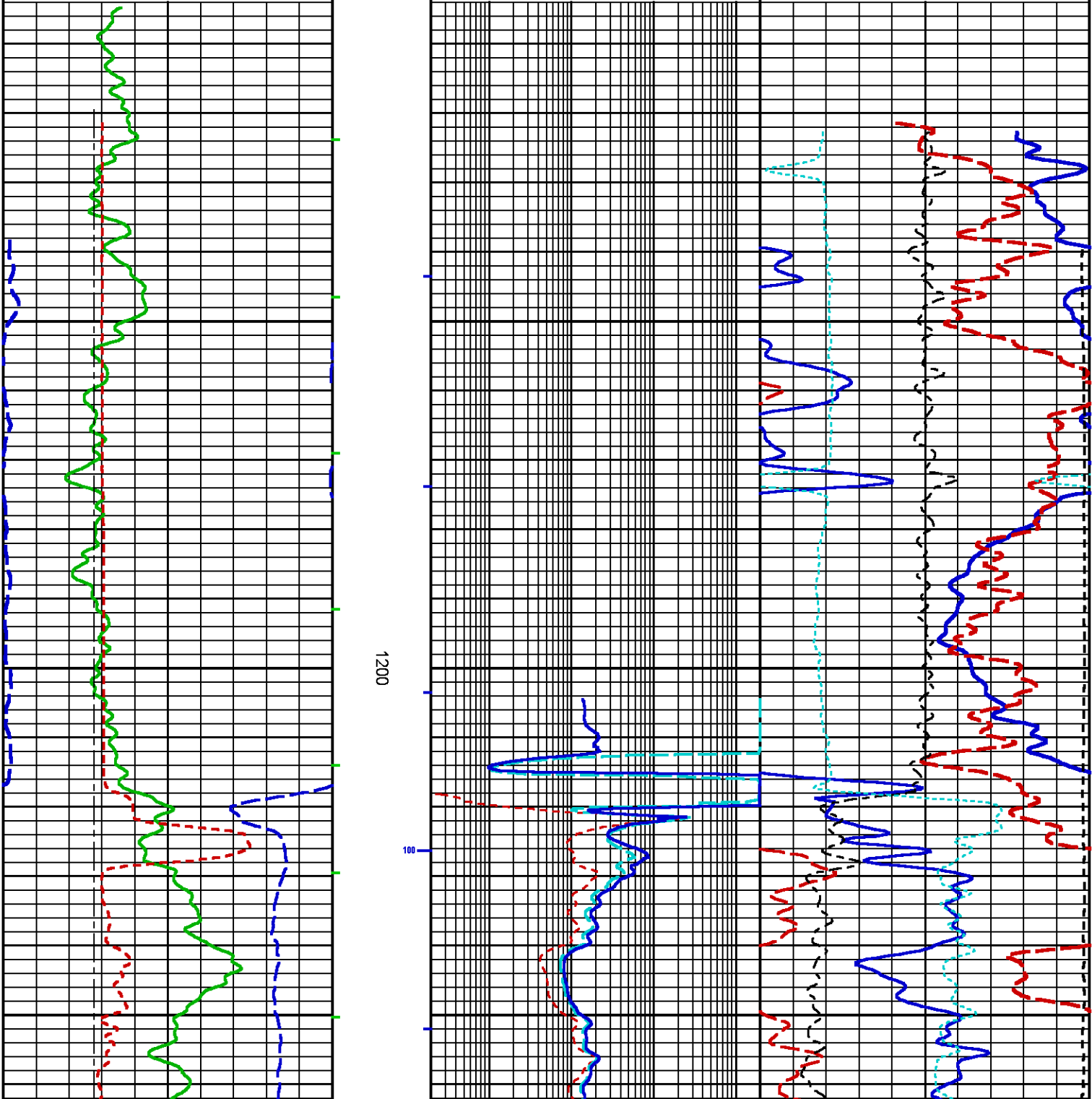
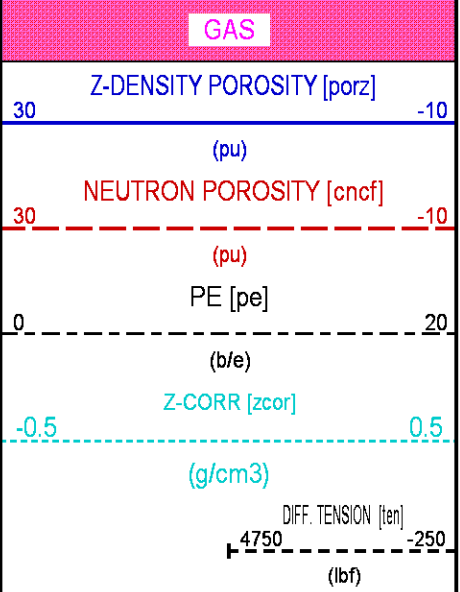
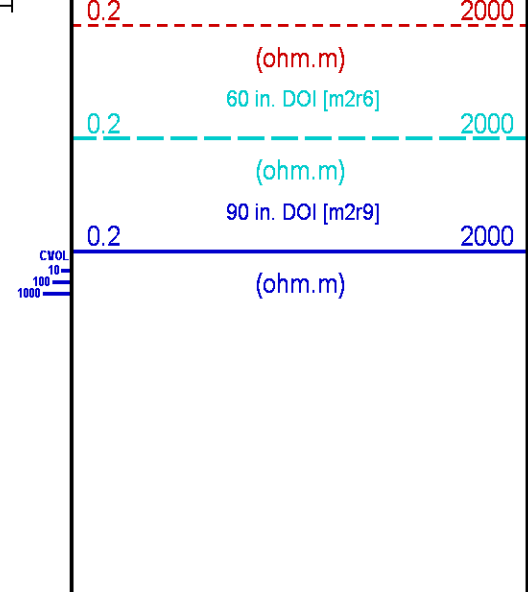
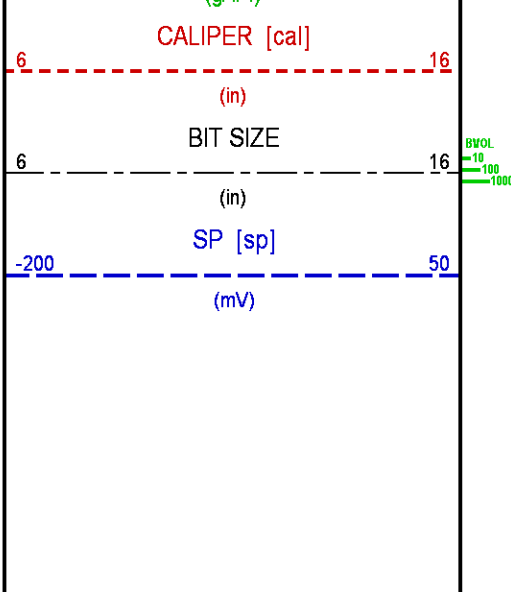
## CURVE MEASURE POINT OFFSET

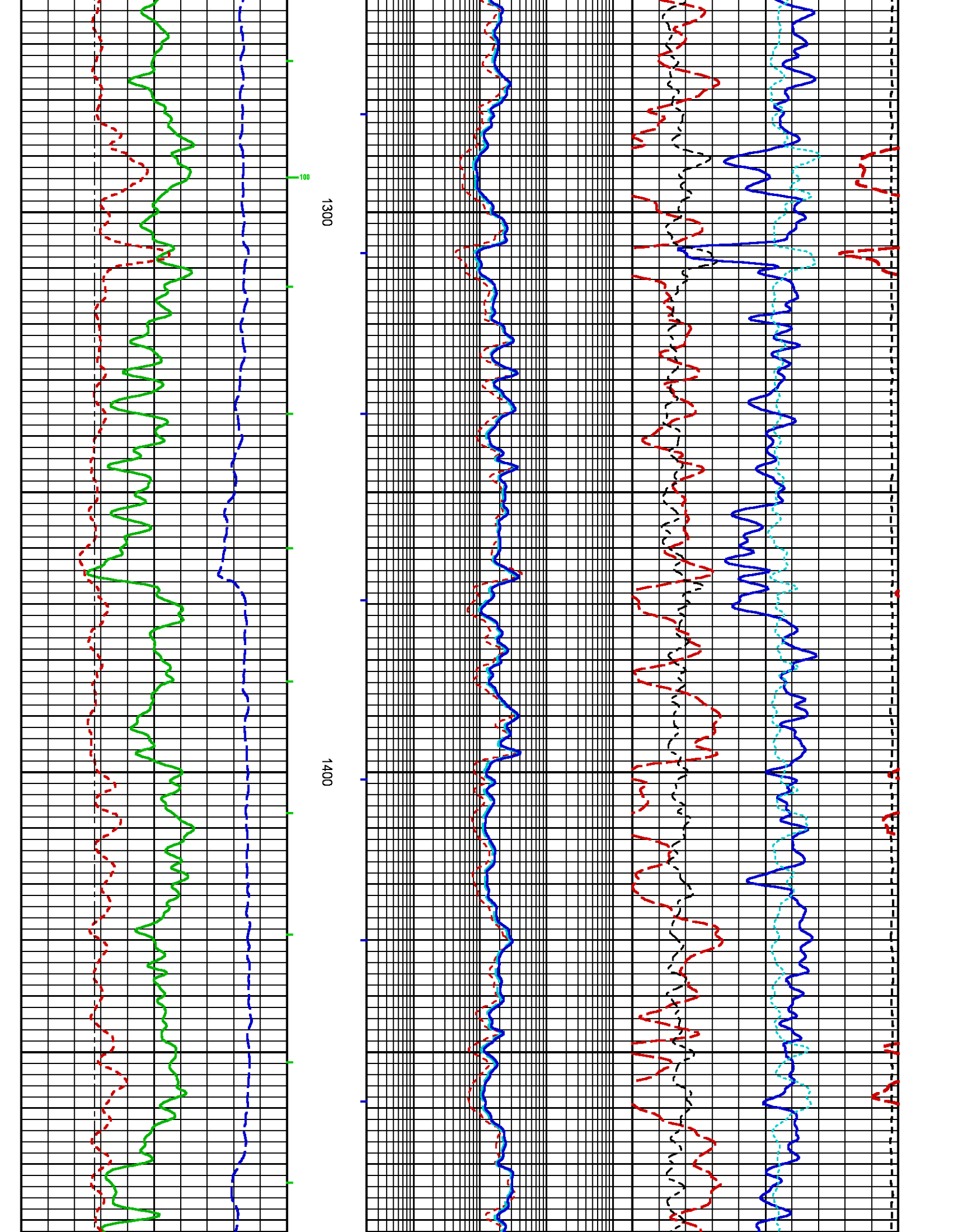
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
BIT	0.00	GR	35.00	M2R9	2.75	SP	1.25
CAL	18.12	M2R1	2.75	PE	18.00	TEN	0.00
CNCF	27.38	M2R6	2.75	PORZ	18.00	ZCOR	18.00

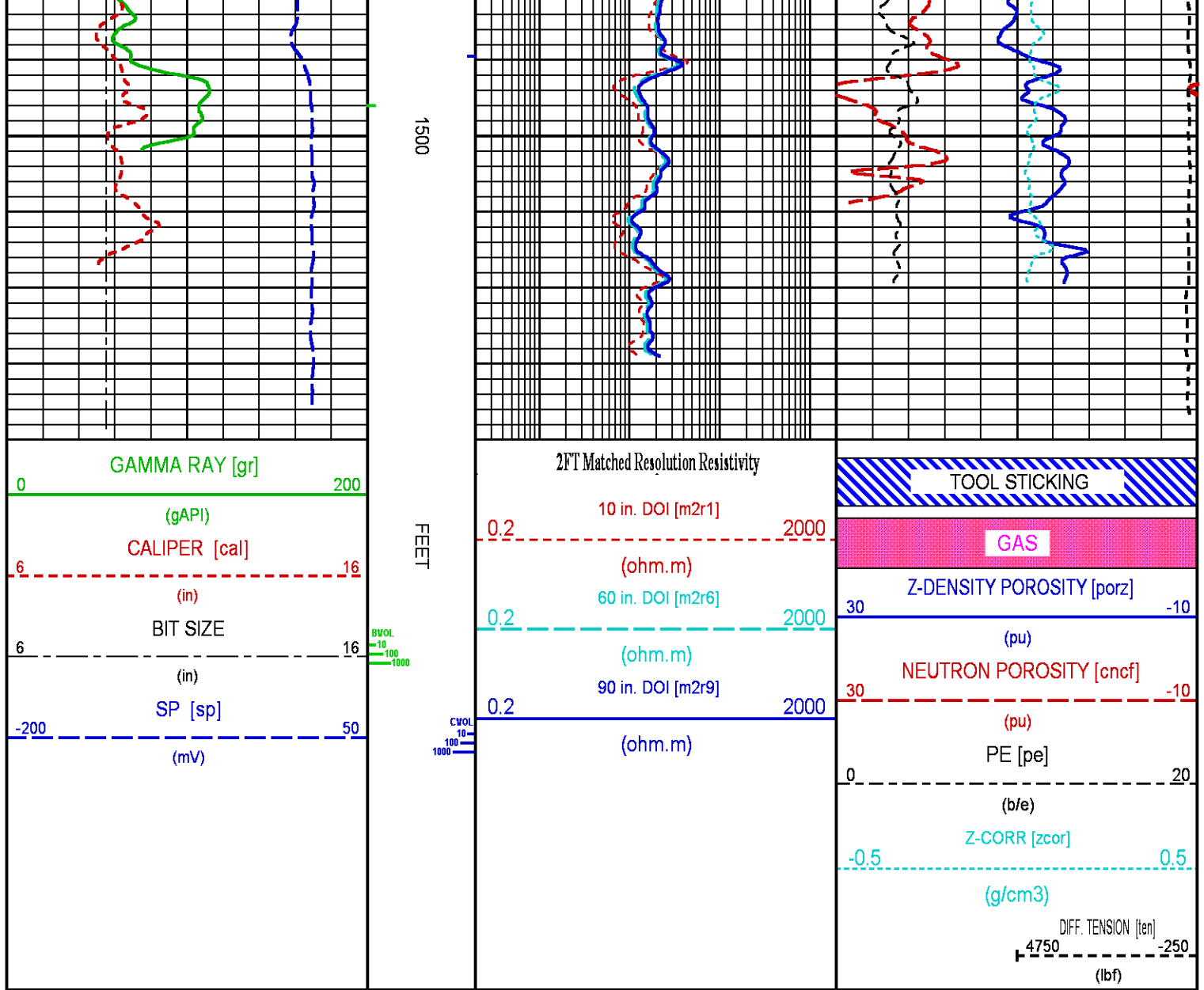
Presentation : cas6685:/dat1a/OH101021/WPX\_REPEAT.fvpdf [5"/100' Scale]  
 Plot Interval : 1104.75 - 1542.5 Feet

Data File 1 : F1 : cas6685:/dat1a/OH101021/n970aR01\_REPEAT.xtf  
 Created On : Nov 25 01:13:06 2015  
 Company : WPX ENERGY INC  
 Well : FEDERAL RU 21-8  
 Field : RULISON  
 File Interval : 0 - 1543.75 Feet  
 OCT : n970a









## CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/OH101021/n970a.tp1

## TTMA PRIMARY CALIBRATION SUMMARY

TOOL #: 3980XA 10121559

DATE/TIME PERFORMED: Sun Sep 6 08:34:21 2015

UNIT #: 3885TC 6685

ACCEL #: 3980XA 10121559

ACCEL CAL DATE: 13:40 06/07/2004

	GAIN	OFFSET (ohm.m)
Rm K Factors	0.14570	-0.01679

	Sig Low (ohm)	Sig High (ohm)	Mult Factor	Add Factor	Engr Low (ohm)	Engr High (ohm)
Rm Measurements	0.25	9.99	1.001267	-0.000138	0.25	10.00
	0.20 0.30	8.00 12.00				

### TTMA BEFORE LOG VERIFICATION SUMMARY

TOOL #: 3980XA 10121559      DATE/TIME PERFORMED: Tue Nov 24 23:57:32 2015      DAYS SINCE CAL: 79

UNIT #: 3885TC 6685

	CHT (lbf)	MUD TEMP (degF)	RES M Q (ohm)	ACCEL Q
CAL	19450	499.71	9.99	1000.72
	18659 20259	489.20 503.60	8.00 12.00	980.00 1020.00
ZERO	-24412	-436.02	0.250	1000.903
	-25212 -23612	-443.20 -428.80	0.200 0.300	980.000 1020.000

### TTMA AFTER LOG VERIFICATION SUMMARY

TOOL #: 3980XA 10121559      DATE/TIME PERFORMED: Wed Nov 25 18:27:20 2015      DAYS SINCE CAL: 80

UNIT #: 3885TC 6685

	CHT (lbf)	MUD TEMP (degF)	RES M Q (ohm)	ACCEL Q
CAL	19460	501.31	9.98	1000.69
	18659 20259	489.20 503.60	8.00 12.00	980.00 1020.00
ZERO	-24412	-436.02	0.250	1000.542
	-25212 -23612	-443.20 -428.80	0.200 0.300	980.000 1020.000

### GR PRIMARY CALIBRATION SUMMARY

Tool #: 3518EG 10126398      DATE/TIME PERFORMED: Fri Nov 13 13:09:58 2015

Unit #: 3880TA HL6670      Jig Series: 4702NK WA-612

Background	Calibrator ON	Jig Value (gAPI)	Mult	Background (gAPI)	Calibrator ON (gAPI)
103.78	791.03	185	0.269	27.94	212.94
			0.230 0.280		

### GR BEFORE LOG VERIFICATION SUMMARY

TOOL #: 3518EG 10126398      DATE/TIME PERFORMED: Tue Nov 24 23:57:27 2015      DAYS SINCE CAL: 11

UNIT #: 3885TC 6685      Jig: INTRNL N/A

Counts	TEMP (degF)	HV (V)
977.33	61.00	1361.74
929.00 1027.00	536.00	1237.00 1512.00

## GR AFTER LOG VERIFICATION SUMMARY

TOOL #:  DATE/TIME PERFORMED:  DAYS SINCE CAL:

UNIT #:  Jig:

Counts	TEMP (degF)	HV (V)
976.67	112.09	1363.96
929.00 1027.00	536.00	1237.00 1512.00

## CN PRIMARY CALIBRATION SUMMARY

TOOL #:  DATE/TIME PERFORMED:

UNIT #:  CALIBRATOR #:  SOURCE #:

SSN DT CPS	LSN DT CPS	SSN/LSN	MCF	CNRATIO	CN PU
4699.81	802.94	5.85326	0.98014	5.73700	25.241
			0.95000 1.05000		

## CN BEFORE LOG VERIFICATION SUMMARY

TOOL #:  DATE/TIME PERFORMED:  DAYS SINCE CAL:

UNIT #:  CALIBRATOR #:

SSN DT CPS	LSN DT CPS	SSN/LSN	TEMP (degF)	HV (V)	LV (V)
992.41	994.44	0.99797	55.8	1322.0	4.624
		0.95000 1.05000	280.4	1250.0 1450.0	4.300 5.000

## CN AFTER LOG VERIFICATION SUMMARY

TOOL #:  DATE/TIME PERFORMED:  DAYS SINCE CAL:

UNIT #:  CALIBRATOR #:

SSN DT CPS	LSN DT CPS	SSN/LSN	TEMP (degF)	HV (V)	LV (V)
992.09	994.11	0.99797	109.4	1323.5	4.626
		0.95000 1.05000	280.4	1250.0 1450.0	4.300 5.000

## CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 2223XA 10090664

DATE/TIME PERFORMED: Fri Nov 6 10:25:00 2015

UNIT #: 3885TC 6685

	SIZE (in)	VALUE	MULTIPLIER	ADD
SMALL RING (Arm)	7.000	1128.0		
LARGE RING (Arm)	11.000	2369.6	0.00322	3.36598
PAD CLOSED		1616.8	0.00250	-4.04200

## CAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2223XA 10090664

DATE/TIME PERFORMED: Wed Nov 25 00:27:01 2015

DAYS SINCE CAL: 18

UNIT #: 3885TC 6685

	VALUE	MULTIPLIER	ADD	SIZE (in)
ARM	1820.0	0.00322	2.63260	8.5
PAD	1818.8	0.00250	-4.04200	0.5

	ACTUAL (in)	MEASURED (in)
DIAMETER (arm+pad)	9.001	9.0
		8.6 9.4

## CAL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2223XA 10090664

DATE/TIME PERFORMED: Wed Nov 25 18:26:28 2015

DAYS SINCE CAL: 19

UNIT #: 3885TC 6685

	VALUE	MULTIPLIER	ADD	SIZE (in)
ARM	1816.0	0.00322	2.63260	8.5
PAD	1836.0	0.00250	-4.04200	0.5

	ACTUAL (in)	MEASURED (in)
DIAMETER (arm+pad)	9.001	9.0
		8.6 9.4

## ZDL PRIMARY CALIBRATION SUMMARY

TOOL: 2223XA 10090664

DATE/TIME PERFORMED: Fri Nov 6 10:52:15 2015

UNIT: 3885TC 6685

CALB BLKS: 2225XA 094292F

CS SRC: 4705XA 16068B

PAD TYPE: PADTYP 7.5" PAD

	SS CS PK (Channel)	LS CS PK (Channel)	SS_BKGD (cps)	LS BKGD (cps)		
	225.5	226.4	1224.0	1577.3		
	220.0 230.0	220.0 230.0				
	SS (cps)	LS (cps)	SHR	DEN (g/cm3)	CORR (g/cm3)	PE (b/e)
MG (LO PE)	33131.8	12136.5	0.754	1.679	0.000	1.900
			0.720 0.890			
AL	20939.1	1379.6		2.667	-0.016	
AL + SHIM	27743.0	2401.3		2.558	0.098	
MG + SHIM (HI PE)	16309.0	5757.3	0.299			8.550
			0.280 0.360			
RATIO AL + SHIM/AL	1.32	1.74				
	1.30 1.40	1.60 1.80				
RATIO MG/AL	1.58	8.80				
	1.58 1.70	8.55 9.55				

## ZDL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2223XA 10090664

DATE/TIME PERFORMED: Tue Nov 24 23:57:05 2015

DAYS SINCE CAL: 18

UNIT #: 3885TC 6685

	TOTAL (cps)	CSPK (Channel)	HV (V)
LS	3342.1	224.8	1355.2
	3332.1 3352.1	220.0 230.0	1250.0 1550.0
SS	22355.0	224.1	1333.6
	22344.8 22364.8	220.0 230.0	1250.0 1550.0
	LV (V)	PAD CURRENT (mA)	
	5.0	76.8	
	4.8 5.2	50.0 120.0	

## ZDL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2223XA 10090664

DATE/TIME PERFORMED: Wed Nov 25 18:26:10 2015

DAYS SINCE CAL: 19

UNIT #: 3885TC 6685

	TOTAL (cps)	CSPK (Channel)	HV (V)
LS	3342.1	223.9	1405.7
	3332.1 3352.1	220.0 230.0	1250.0 1550.0
SS	22354.8	224.2	1365.0
	22344.8 22364.8	220.0 230.0	1250.0 1550.0
	LV (V)	PAD CURRENT (mA)	
	5.0	76.8	
	4.8 5.2	50.0 120.0	

## HDIL PRIMARY CALIBRATION SUMMARY

TOOL #: 1530XA 10415933

DATE/TIME PERFORMED: Tue Jun 30 07:53:32 2015

UNIT #: 3885TC 6685

GRCOND ID & DATE: 86 101801

ZERO DATA(mv)	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 R	0.0017 -0.2000 0.2000	0.0005 -0.1000 0.1000	0.0000 -0.1000 0.1000	0.0009 -0.1000 0.1000	-0.0004 -0.1000 0.1000	-0.0002 -0.1000 0.1000	0.0001 -0.1000 0.1000	-0.0008 -0.1000 0.1000
Coil 0 Q	-0.0009 -0.5000 0.5000	0.0004 -0.2000 0.2000	0.0012 -0.1000 0.1000	0.0003 -0.1000 0.1000	0.0003 -0.1000 0.1000	0.0006 -0.1000 0.1000	-0.0002 -0.1000 0.1000	-0.0004 -0.1000 0.1000
Coil 1 R	-0.0005 -0.2000 0.2000	-0.0002 -0.1000 0.1000	0.0009 -0.1000 0.1000	0.0027 -0.1000 0.1000	-0.0003 -0.1000 0.1000	0.0003 -0.1000 0.1000	-0.0011 -0.1000 0.1000	-0.0020 -0.1000 0.1000
Coil 1 Q	-0.0077 -0.5000 0.5000	-0.0024 -0.2000 0.2000	0.0019 -0.1000 0.1000	0.0028 -0.1000 0.1000	-0.0021 -0.1000 0.1000	-0.0015 -0.1000 0.1000	-0.0007 -0.1000 0.1000	-0.0005 -0.1000 0.1000
Coil 2 R	0.0005 -0.2000 0.2000	-0.0032 -0.1000 0.1000	0.0025 -0.1000 0.1000	0.0029 -0.1000 0.1000	-0.0019 -0.1000 0.1000	0.0013 -0.1000 0.1000	0.0018 -0.1000 0.1000	-0.0016 -0.1000 0.1000
Coil 2 Q	0.0029 -0.5000 0.5000	-0.0005 -0.2000 0.2000	0.0027 -0.1000 0.1000	-0.0032 -0.1000 0.1000	0.0012 -0.1000 0.1000	0.0017 -0.1000 0.1000	-0.0013 -0.1000 0.1000	0.0005 -0.1000 0.1000
Coil 3 R	0.0151 -0.3000 0.3000	-0.0024 -0.1000 0.1000	0.0059 -0.1000 0.1000	-0.0046 -0.1000 0.1000	0.0042 -0.1000 0.1000	-0.0008 -0.1000 0.1000	-0.0009 -0.1000 0.1000	-0.0031 -0.1000 0.1000
Coil 3 Q	-0.0117 -0.5000 0.5000	0.0033 -0.2000 0.2000	-0.0054 -0.1000 0.1000	-0.0020 -0.1000 0.1000	0.0047 -0.1000 0.1000	0.0037 -0.1000 0.1000	-0.0011 -0.1000 0.1000	0.0029 -0.1000 0.1000
Coil 4 R	-0.0069 -0.5000 0.5000	0.0014 -0.2000 0.2000	0.0050 -0.2000 0.2000	-0.0007 -0.2000 0.2000	0.0121 -0.2000 0.2000	0.0011 -0.2000 0.2000	-0.0022 -0.2000 0.2000	0.0014 -0.2000 0.2000
Coil 4 Q	-0.0108 -1.0000 1.0000	-0.0053 -0.4000 0.4000	-0.0070 -0.2000 0.2000	0.0005 -0.2000 0.2000	-0.0021 -0.2000 0.2000	0.0078 -0.2000 0.2000	-0.0000 -0.2000 0.2000	0.0121 -0.2000 0.2000
Coil 5 R	0.0243 -1.2000 1.2000	0.0175 -0.4000 0.4000	-0.0146 -0.4000 0.4000	0.0328 -0.4000 0.4000	-0.0136 -0.4000 0.4000	-0.0018 -0.4000 0.4000	-0.0087 -0.4000 0.4000	-0.0134 -0.4000 0.4000
Coil 5 Q	-0.0147 -1.5000 1.5000	-0.0077 -0.8000 0.8000	0.0042 -0.4000 0.4000	-0.0148 -0.4000 0.4000	-0.0123 -0.4000 0.4000	0.0093 -0.4000 0.4000	-0.0047 -0.4000 0.4000	0.0049 -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	163.36 136.00 186.00	161.97 134.00 184.00	159.17 131.00 181.00	155.00 126.00 176.00	149.42 122.00 170.00	142.55 118.00 161.00	134.32 112.00 150.00	124.93 105.00 139.00
Coil 0 P	7.751 6.000 9.000	25.548 21.000 30.000	42.916 35.000 50.000	60.258 49.000 71.000	77.639 63.000 91.000	95.046 77.000 109.000	112.509 92.000 130.000	129.981 106.000 151.000
Coil 1 M	285.72	282.01	277.56	269.52	259.04	246.20	231.64	215.04

Coil 1 M	285.73 238.00 328.00	283.01 235.00 325.00	277.56 230.00 320.00	269.53 225.00 312.00	259.04 218.00 302.00	246.39 208.00 288.00	231.61 196.00 266.00	215.04 184.00 244.00
Coil 1 P	7.779 6.000 9.000	25.655 21.000 30.000	43.064 35.000 51.000	60.393 49.000 71.000	77.698 63.000 92.000	94.952 78.000 112.000	112.194 93.000 130.000	129.374 107.000 151.000
Coil 2 M	584.09 479.00 659.00	578.61 474.00 654.00	567.66 463.00 643.00	551.64 450.00 622.00	530.72 432.00 602.00	505.34 412.00 572.00	475.61 390.00 540.00	442.00 359.00 499.00
Coil 2 P	7.831 6.000 9.000	25.813 21.000 31.000	43.326 35.000 51.000	60.764 49.000 71.000	78.187 63.000 92.000	95.599 76.000 115.000	112.998 92.000 135.000	130.399 105.000 155.000
Coil 3 M	934.04 772.00 1060.00	925.92 764.00 1050.00	909.50 752.00 1030.00	884.96 728.00 1010.00	852.71 700.00 970.00	812.92 665.00 925.00	765.62 628.00 868.00	711.94 589.00 799.00
Coil 3 P	7.835 6.000 10.000	25.767 21.000 30.000	43.272 35.000 51.000	60.733 49.000 72.000	78.209 63.000 93.000	95.707 76.000 114.000	113.198 90.000 135.000	130.671 104.000 156.000
Coil 4 M	1501.2 1210.0 1700.0	1487.8 1205.0 1690.0	1460.2 1180.0 1650.0	1419.1 1140.0 1590.0	1365.4 1120.0 1530.0	1299.5 1070.0 1450.0	1222.1 1000.0 1350.0	1134.7 942.0 1240.0
Coil 4 P	7.854 6.000 10.000	25.964 21.000 31.000	43.609 35.000 52.000	61.193 49.000 73.000	78.774 63.000 93.000	96.340 77.000 114.000	113.887 91.000 135.000	131.394 105.000 156.000
Coil 5 M	3024.7 2450.0 3450.0	2997.6 2420.0 3400.0	2940.3 2410.0 3320.0	2855.9 2350.0 3200.0	2745.6 2280.0 3080.0	2611.7 2150.0 2950.0	2452.8 2020.0 2750.0	2276.1 1870.0 2570.0
Coil 5 P	8.027 6.000 10.000	26.404 20.000 31.000	44.317 35.000 52.000	62.162 49.000 73.000	79.997 63.000 94.000	97.839 79.000 113.000	115.630 93.000 134.000	133.470 106.000 156.000

AM Factor      10 KHz      30 KHz      50 KHz      70 KHz      90 KHz      110 KHz      130 KHz      150 KHz

Coil 0 R	-1697 -3200 940	-837 -1400 -20	-583 -930 -150	-466 -760 -160	-398 -660 -130	-353 -600 -120	-322 -550 -110	-298 -520 -92
Coil 0 Q	-851 -15000 11000	-829 -5800 3800	-677 -3700 2100	-587 -2700 1400	-531 -2200 1000	-495 -1800 790	-473 -1600 620	-459 -1500 490
Coil 1 R	-250 -750 460	-188 -360 83	-159 -280 9	-141 -230 -10	-127 -200 -26	-116 -180 -35	-107 -160 -46	-100 -150 -49
Coil 1 Q	-182 -3300 3300	-137 -1100 960	-117 -630 530	-108 -470 360	-104 -380 260	-101 -320 190	-97 -290 150	-95 -260 120
Coil 2 R	-7.6 -85.0 76.0	-36.1 -64.0 -0.4	-37.0 -57.0 -12.0	-34.8 -51.0 -16.0	-31.8 -46.0 -17.0	-29.1 -42.0 -16.0	-26.6 -39.0 -15.0	-24.1 -37.0 -13.0
Coil 2 Q	-247.2 -1500.0 1900.0	-84.4 -500.0 610.0	-54.4 -290.0 350.0	-42.1 -220.0 260.0	-34.5 -160.0 190.0	-29.0 -140.0 160.0	-24.2 -110.0 130.0	-20.5 -99.0 120.0
Coil 3 R	0.0 -23.0 21.0	-9.5 -22.0 1.6	-10.3 -21.0 -1.3	-9.9 -20.0 -1.8	-9.4 -19.0 -2.0	-8.6 -19.0 -1.3	-8.1 -19.0 -0.8	-7.4 -19.0 -0.0
Coil 3 Q	-52.1 -540.0 530.0	-14.1 -180.0 180.0	-6.0 -100.0 110.0	-1.2 -71.0 81.0	2.3 -51.0 66.0	5.9 -37.0 58.0	9.1 -28.0 53.0	11.9 -21.0 51.0
Coil 4 R	-6.22 -18.00 13.00	-4.67 -12.00 2.70	-4.61 -11.00 1.50	-4.39 -9.80 0.52	-4.37 -9.90 0.96	-3.76 -10.00 1.50	-3.42 -11.00 2.30	-3.20 -11.00 2.60
Coil 4 Q	26.02 -250.00 280.00	10.74 -79.00 98.00	10.39 -43.00 64.00	11.79 -27.00 51.00	13.56 -18.00 46.00	16.28 -11.00 42.00	18.70 -5.50 42.00	21.74 -1.00 42.00
Coil 5 R	-0.88 -56.00 51.00	-3.31 -8.40 3.60	-2.81 -6.90 1.10	-2.34 -6.90 1.20	-2.29 -9.30 2.90	-2.18 -14.00 6.30	-2.08 -19.00 9.60	-2.05 -24.00 13.00
Coil 5 Q	-24.31 -88.00 69.00	-3.68 -26.00 27.00	2.00 -14.00 22.00	6.29 -7.00 22.00	9.77 -2.50 24.00	13.27 1.10 26.00	16.31 4.10 29.00	19.70 7.10 32.00

MM Factor      10 KHz      30 KHz      50 KHz      70 KHz      90 KHz      110 KHz      130 KHz      150 KHz

Coil 0 M	0.969 0.850 1.100	0.976 0.860 1.100	0.980 0.870 1.100	0.981 0.880 1.100	0.982 0.880 1.100	0.983 0.880 1.100	0.983 0.880 1.100	0.983 0.880 1.100
Coil 0 P	-0.249 -1.500 1.500	-0.383 -1.500 1.500	-0.288 -1.500 1.500	-0.188 -1.500 1.500	-0.109 -1.500 1.500	-0.062 -1.500 1.500	-0.009 -1.500 1.500	0.024 -1.500 1.500
Coil 1 M	0.961 0.850 1.100	0.968 0.860 1.100	0.971 0.870 1.100	0.973 0.880 1.100	0.973 0.880 1.100	0.974 0.880 1.100	0.974 0.880 1.100	0.974 0.880 1.100
Coil 1 P	-0.228 -0.850 0.400	-0.376 -0.860 0.400	-0.266 -0.870 0.400	-0.171 -0.880 0.400	-0.068 -0.880 0.400	-0.024 -0.880 0.400	0.010 -0.880 0.400	0.057 -0.880 0.400

Coil 1 M	0.984	0.984	0.984	0.984	0.984	0.984	0.983	0.983
Coil 1 P	0.043	0.057	0.104	0.135	0.173	0.191	0.215	0.210
Coil 2 M	0.984	0.984	0.984	0.984	0.984	0.984	0.983	0.983
Coil 2 P	0.043	0.057	0.104	0.135	0.173	0.191	0.215	0.210
Coil 3 M	0.993	0.993	0.993	0.993	0.992	0.992	0.991	0.991
Coil 3 P	0.067	0.097	0.153	0.209	0.266	0.310	0.333	0.342
Coil 4 M	0.998	0.999	0.999	0.998	0.998	0.997	0.996	0.996
Coil 4 P	0.038	0.052	0.093	0.127	0.188	0.205	0.235	0.258
Coil 5 M	0.999	0.999	0.999	0.999	0.999	0.998	0.997	0.996
Coil 5 P	0.020	0.050	0.080	0.111	0.180	0.278	0.238	0.270

PARMS TCID 0 TCID 1 Cal Temp T Factor  
(degF)  
IDs 3.659 0.987 79.5 1.00

### HDIL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1530XA 10415933 DATE/TIME PERFORMED: Tue Nov 24 23:57:22 2015 DAYS SINCE CAL: 147  
UNIT #: 3885TC 6685

ZERO DATA(mv)	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 R	0.000	-0.001	-0.001	-0.001	0.000	-0.001	0.001	-0.000
Coil 0 Q	-0.003	-0.001	0.001	0.000	-0.000	-0.000	0.000	-0.001
Coil 1 R	-0.001	0.001	0.000	0.000	-0.001	-0.001	0.000	-0.001
Coil 1 Q	-0.010	0.002	0.000	0.003	-0.002	-0.000	-0.001	0.001
Coil 2 R	0.001	0.005	0.003	-0.000	0.002	0.003	-0.000	-0.001
Coil 2 Q	-0.004	0.006	0.001	-0.001	-0.001	-0.001	0.001	0.001
Coil 3 R	0.009	-0.005	0.006	-0.000	0.003	-0.002	-0.004	0.006
Coil 3 Q	-0.004	0.002	0.005	0.002	0.005	-0.002	-0.005	0.007
Coil 4 R	0.010	0.002	-0.008	-0.002	-0.001	-0.001	-0.014	0.009
Coil 4 Q	-0.013	0.010	0.002	0.004	-0.004	-0.006	0.006	-0.006
Coil 5 R	0.011	0.001	0.003	-0.006	0.012	-0.005	0.010	-0.008
Coil 5 Q	0.010	-0.008	0.008	0.007	0.001	-0.017	-0.006	0.006

ELEC. GAINS	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	163.45	162.07	159.26	155.07	149.51	142.58	134.37	124.94
	136.00 186.00	134.00 184.00	131.00 181.00	126.00 176.00	122.00 170.00	118.00 161.00	112.00 150.00	105.00 139.00
Coil 0 P	7.805	25.549	42.897	60.224	77.589	94.989	112.432	129.887
	-1.000 12.000	19.000 30.000	35.000 50.000	49.000 71.000	63.000 91.000	77.000 110.000	92.000 130.000	105.000 151.000
Coil 1 M	285.76	283.04	277.58	269.55	259.06	246.31	231.55	214.99
	237.00 327.00	235.00 325.00	230.00 320.00	225.00 312.00	218.00 302.00	208.00 288.00	196.00 266.00	184.00 244.00
Coil 1 P	7.828	25.659	43.048	60.362	77.650	94.900	112.116	129.277
	-1.000 12.000	19.000 30.000	35.000 51.000	49.000 71.000	63.000 92.000	77.000 112.000	92.000 132.000	105.000 153.000
Coil 2 M	585.19	579.72	568.77	552.61	531.66	506.08	476.32	442.61
	479.00 659.00	474.00 654.00	463.00 643.00	450.00 622.00	432.00 602.00	412.00 572.00	390.00 540.00	359.00 499.00
Coil 2 P	7.891	25.815	43.303	60.724	78.131	95.517	112.920	130.288
	-1.000 12.000	19.000 31.000	35.000 51.000	49.000 71.000	63.000 92.000	77.000 114.000	92.000 135.000	105.000 156.000
Coil 3 M	934.90	926.83	910.36	885.76	853.42	813.41	766.22	712.10
	772.00 1060.00	764.00 1050.00	752.00 1030.00	728.00 1010.00	700.00 970.00	665.00 925.00	628.00 868.00	589.00 799.00
Coil 3 P	7.886	25.765	43.243	60.690	78.141	95.632	113.107	130.566
	-2.000 13.000	19.000 31.000	35.000 52.000	49.000 72.000	63.000 93.000	77.000 114.000	92.000 135.000	105.000 156.000
Coil 4 M	1501.9	1488.4	1460.8	1419.6	1366.0	1299.4	1222.0	1134.3
	1210.0 1700.0	1205.0 1690.0	1180.0 1650.0	1140.0 1590.0	1120.0 1530.0	1070.0 1450.0	1000.0 1350.0	942.0 1240.0
Coil 4 P	7.908	25.957	43.580	61.142	78.702	96.251	113.782	131.273
	-2.000 13.000	19.000 31.000	35.000 52.000	49.000 73.000	63.000 93.000	78.000 114.000	92.000 135.000	105.000 156.000
Coil 5 M	3028.1	3001.0	2943.1	2857.8	2747.6	2611.1	2455.6	2277.9
	2450.0 3450.0	2420.0 3400.0	2410.0 3320.0	2350.0 3200.0	2280.0 3080.0	2150.0 2950.0	2020.0 2750.0	1870.0 2570.0
Coil 5 P	8.070	26.395	44.300	62.129	79.940	97.771	115.543	133.313
	-2.000 13.000	19.000 31.000	35.000 52.000	49.000 73.000	63.000 94.000	79.000 114.000	93.000 135.000	106.000 156.000

## HDIL AFTER LOG VERIFICATION SUMMARY

TOOL #: 1530XA 10415933      DATE/TIME PERFORMED: Wed Nov 25 18:27:17 2015      DAYS SINCE CAL: 148

UNIT #: 3885TC 6685

ZERO DATA(mv)	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 R	0.000	0.000	0.000	0.001	0.001	-0.000	-0.000	0.001
	-0.080 0.080	-0.061 0.059	-0.031 0.029	-0.031 0.029	-0.030 0.030	-0.031 0.029	-0.029 0.031	-0.030 0.030
Coil 0 Q	-0.001	0.001	-0.000	0.000	0.000	0.000	0.001	-0.000
	-0.043 0.037	-0.121 0.119	-0.029 0.031	-0.030 0.030	-0.030 0.030	-0.030 0.030	-0.030 0.030	-0.031 0.029
Coil 1 R	-0.001	0.001	-0.001	0.001	-0.000	-0.002	-0.000	-0.002
	-0.081 0.079	-0.049 0.051	-0.030 0.030	-0.030 0.030	-0.031 0.029	-0.031 0.029	-0.030 0.030	-0.031 0.029
Coil 1 Q	-0.004	-0.001	-0.001	-0.001	0.001	0.001	0.000	0.001
	-0.410 0.390	-0.098 0.102	-0.030 0.030	-0.027 0.033	-0.032 0.028	-0.030 0.030	-0.031 0.029	-0.029 0.031
Coil 2 R	0.009	-0.004	0.002	-0.001	-0.004	-0.000	-0.000	-0.003
	-0.069 0.071	-0.025 0.035	-0.027 0.033	-0.030 0.030	-0.028 0.032	-0.027 0.033	-0.030 0.030	-0.031 0.029
Coil 2 Q	-0.006	0.000	0.004	0.001	-0.000	0.001	0.000	-0.002
	-0.354 0.346	-0.094 0.106	-0.029 0.031	-0.031 0.029	-0.031 0.029	-0.031 0.029	-0.029 0.031	-0.029 0.031
Coil 3 R	0.017	0.004	0.003	0.002	-0.006	0.002	-0.000	0.005
	-0.031 0.049	-0.045 0.035	-0.034 0.046	-0.040 0.040	-0.037 0.043	-0.042 0.038	-0.044 0.036	-0.034 0.046
Coil 3 Q	-0.007	0.003	0.003	0.002	-0.010	-0.003	0.005	0.001
	-0.204 0.196	-0.078 0.082	-0.035 0.045	-0.038 0.042	-0.035 0.045	-0.042 0.038	-0.045 0.035	-0.033 0.047
Coil 4 R	0.009	0.012	0.005	-0.007	0.001	-0.004	0.002	-0.003
	-0.050 0.070	-0.058 0.062	-0.068 0.052	-0.062 0.058	-0.061 0.059	-0.061 0.059	-0.074 0.046	-0.051 0.069
Coil 4 Q	0.001	0.001	0.005	0.005	0.003	0.001	0.011	0.005
	-0.031 0.031	-0.031 0.031	-0.035 0.035	-0.035 0.035	-0.033 0.033	-0.031 0.031	-0.041 0.041	-0.035 0.035

Coil 4 Q	-0.011	0.004	-0.005	-0.005	-0.003	-0.004	-0.011	-0.002
	-0.313	0.287	-0.090	0.110	-0.058	0.062	-0.056	0.064
Coil 5 R	0.014	-0.009	0.002	-0.008	-0.014	-0.003	0.011	-0.008
	-0.109	0.131	-0.119	0.121	-0.117	0.123	-0.126	0.114
Coil 5 Q	-0.010	-0.025	0.012	-0.017	-0.015	-0.009	0.007	-0.008
	-0.590	0.610	-0.258	0.242	-0.112	0.128	-0.113	0.127

ELEC. GAINS      10 KHz      30 KHz      50 KHz      70 KHz      90 KHz      110 KHz      130 KHz      150 KHz

Coil 0 M	163.15	161.76	158.95	154.78	149.24	142.31	134.07	124.67
	160.18	166.72	158.83	165.31	156.07	162.44	151.97	158.17
Coil 0 P	7.534	25.540	42.995	60.405	77.842	95.315	112.832	130.349
	4.805	10.805	22.549	28.549	39.897	45.897	57.224	63.224
Coil 1 M	285.94	283.20	277.71	269.69	259.24	246.39	231.64	215.09
	280.05	291.48	277.38	288.71	272.03	283.13	264.15	274.94
Coil 1 P	7.571	25.653	43.142	60.533	77.878	95.203	112.495	129.714
	4.828	10.828	22.659	28.659	40.048	46.048	57.362	63.362
Coil 2 M	582.49	577.02	566.10	550.02	529.27	503.52	473.83	440.32
	573.49	596.89	568.13	591.32	557.39	580.14	541.56	563.66
Coil 2 P	7.593	25.804	43.405	60.904	78.390	95.878	113.341	130.769
	4.891	10.891	22.815	28.815	40.303	46.303	57.724	63.724
Coil 3 M	933.39	925.26	908.82	884.44	852.17	811.66	764.51	710.66
	916.20	953.59	908.30	945.37	892.15	928.56	868.05	903.48
Coil 3 P	7.601	25.765	43.354	60.882	78.417	95.965	113.544	131.052
	4.886	10.886	22.765	28.765	40.243	46.243	57.690	63.690
Coil 4 M	1502.1	1488.6	1460.8	1419.7	1365.8	1299.5	1222.1	1133.9
	1471.8	1531.9	1458.6	1518.2	1431.6	1490.0	1391.2	1448.0
Coil 4 P	7.635	25.970	43.701	61.357	79.002	96.631	114.239	131.802
	4.908	10.908	22.957	28.957	40.580	46.580	58.142	64.142
Coil 5 M	3020.6	2993.6	2936.2	2850.7	2742.0	2606.3	2449.0	2271.7
	2967.6	3088.7	2941.0	3061.0	2884.3	3002.0	2800.7	2915.0
Coil 5 P	7.830	26.408	44.404	62.313	80.217	98.112	116.004	133.866
	5.070	11.070	23.395	29.395	41.300	47.300	59.129	65.129

## INSTRUMENT CONFIGURATION

Source File: /dat1a/OH101021/n970a~tdg

**CABLEHEAD**  
 Diameter : 3.38"  
 Length : 5.50'  
 Weight : 24 lbs  
 Series : CABL338  
 Mnemonic : CBLH  
 Measure Point: 2.75': CABLEHEAD TOP

**WTS ADAPTOR**  
 Diameter : 3.62"

**FOCUS SWIVEL**  
 Diameter : 3.13"  
 Length : 2.58'  
 Weight : 50 lbs  
 Series : 3950XA  
 Mnemonic : SWVL

**FOCUS TEN/TEMP/MUD RES/ACCEL**  
 Diameter : 3.13"  
 Length : 4.31'  
 Weight : 61 lbs  
 Series : 3980XA



55.65'

CABLEHEAD TOP — 52.90'

Mnemonic : T1MA

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**FOCUS TELEMETRY (POWER SECTION)**

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

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**FOCUS EB/EG TELEMETRY GAMMA RAY**

Diameter : 3.12"  
 Length : 5.83'  
 Weight : 63 lbs  
 Series : 3518EG  
 Mnemonic : GR  
 Measure Point: 4.24': GR MP

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**FOCUS COMPENSATED NEUTRON**

Diameter : 3.13"  
 Length : 4.81'  
 Weight : 65 lbs  
 Series : 2436XA  
 Mnemonic : CN  
 Measure Point: 1.92': LSN MP  
 Measure Point: 1.46': SSN MP

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**FOCUS Z-DENSILOG**

Diameter : 3.75"  
 Length : 9.58'  
 Weight : 200 lbs  
 Series : 2223XA  
 Mnemonic : ZDL  
 Measure Point: 4.33': CR1 MP  
 Measure Point: 1.69': LSD / CR2 MP  
 Measure Point: 1.29': SSD MP

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**FOCUS KNUCKLE JOINT**

Diameter : 3.13"  
 Length : 1.50'

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**FOCUS KNUCKLE JOINT**

Diameter : 3.13"  
 Length : 1.50'

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**FOCUS HIGH DEFINITION INDUCTION TOOL**

Diameter : 3.13"  
 Length : 13.33'  
 Weight : 115 lbs  
 Series : 1530XA  
 Mnemonic : HDIL  
 Measure Point: 7.17': COIL 5 MP  
 Measure Point: 5.67': COIL 4 MP  
 Measure Point: 4.17': COIL 3 MP  
 Measure Point: 3.67': COIL 2 MP  
 Measure Point: 3.17': COIL 1 MP  
 Measure Point: 2.67': COIL 0 MP  
 Measure Point: 1.14': SP MP

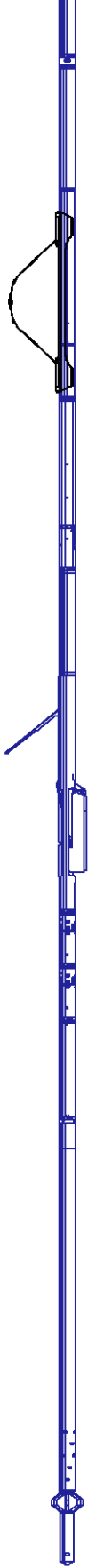
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**FOCUS PINEAPPLE / CABBAGE**

**HOLE FINDER**

Diameter : 2.62"  
 Length : 1.50'

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GR MP — 36.97'

LSN MP — 29.83'  
 SSN MP — 29.38'

CR1 MP — 22.67'

LSD / CR2 MP — 20.02'  
 SSD MP — 19.63'

COIL 5 MP — 9.17'  
 COIL 4 MP — 7.67'  
 COIL 3 MP — 6.17'  
 COIL 2 MP — 5.67'  
 COIL 1 MP — 5.17'  
 COIL 0 MP — 4.67'

SP MP — 3.14'

0.00'

TOTAL LENGTH: 55.65'  
 TOTAL WEIGHT: 831 lbs  
 MAX DIAMETER: 0' 6.13"



**COMPANY** WPX ENERGY INC  
**WELL** FEDERAL RU 21-8  
**FIELD** RULISON  
**COUNTY** GARFIELD STATE COLORADO

**FILE NO:**  
 OH101021  
**API NO:**  
 05045227830000

**LOCATION:**

SHL: 653' FNL 1876' FWL  
BHL: 627' FNL 1436' FWL

SEC 8 TWP 7S RGE 93W

**ELEVATIONS:**

KB 7760 FT  
DF  
GL 7736 FT

SEC 8 T7S R93W  
PAD 21-8  
RIG H&P 318

DATE 25-Nov-2015