



FILE NO: CH145369	COMPANY <b>LARAMIE ENERGY LLC</b>
API NO: 05077105230000	WELL <b>BCU 0993-21-02W</b>
	FIELD <b>BUZZARD CREEK</b>
	COUNTY <b>MESA</b> STATE <b>COLORADO</b>

Ver. 4.11	LOCATION: SHL: 381.0' FNL & 1321.0' FWL	OTHER SERVICES RAL
SEC 21.0	TWP 9.0 S	RGE 93.0 W

PERMANENT DATUM	GL	ELEVATION	7257.0 FT	ELEVATIONS: KB 7287.0 FT DF GL 7257.0 FT
LOG MEASURED FROM	KB	30.0 FT	ABOVE P.D.	
DRILL. MEAS. FROM	KB			

DATE	29-NOV-2018	
RUN	TRIP	
	2	1
SERVICE ORDER	US145369J	
DEPTH DRILLER	7710.0 FT	
DEPTH LOGGER	7636.0 FT	
BOTTOM LOGGED INTERVAL	7633.0 FT	
TOP LOGGED INTERVAL	2250.0 FT	
TIME STARTED	12:00	
TIME FINISHED	18:30	
OPERATOR RIG TIME	6.5 HOURS	
TYPE OF FLUID IN HOLE	WATER	
FLUID DENSITY	NA	
FLUID SALINITY	NA	
FLUID LEVEL	72.0 FT	
LOGGED CEMENT TOP	450.0 FT	
WELLHEAD PRESSURE	0 PSI	
MAXIMUM HOLE DEVIATION	NA	
NOMINAL LOGGING SPEED	10 FMIN	
MAX. RECORDED TEMP.	251.0 DEGF	
REFERENCE LOG	BAKER HUGHES RAL	
REFERENCE LOG DATE	29-NOV-2018	
EQUIP. NO.	LOCATION	
	ML-4268	GRAND JCT.
RECORDED BY	ATUL GUPTA	
WITNESSED BY	NA	

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

#### CASING RECORD

SIZE	WEIGHT	GRADE	FROM	TO
4.5 IN	11.6 LB/F		30.0 FT	7805.0 FT

#### REMARKS

RUN 2 TRIP 1: SJ: 5795.0' - 5816.0'  
SJ: 6859.0' - 6879.0'

#### EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
2	1	PCM	8250EA	166326	FREE
2	1	TEL/CCL	8248ED	387150	FREE
2	1	GR	8262XA	10456406	FREE
2	1	RPM	8281EA	12210975	FREE
2	1	RPM	8283PA	11768879	FREE
2	1	RPM	8281FA	11778241	FREE
2	1	TEMP	8255XA	166343	FREE

# RPM MAIN PASS G-SAND

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017  
Updates: 1

Plotted: Thu Nov 29 18:21:51 2018

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_BCU\_0993\_21\_02W/p353h03.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 2227.521 ft BOTTOM DEPTH: 2949.695 ft

### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
GR	FILTER ( )	medium (1)		TOP BOTTOM

### RPM PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
PNC Parameters	BOREHOLE CONTENTS	FLUID		TOP BOTTOM
	OPEN/CASED HOLE	CASED HOLE		" "
	BOREHOLE SIZE	7.88	in	" "
	LARGEST CASING OD	4.50	in	" "
	MATRIX	SANDSTONE		" "

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_BCU\_0993\_21\_02W/p012g03.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 15.500 ft BOTTOM DEPTH: 7636.000 ft

### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
GR	FILTER ( )	medium (1)		TOP BOTTOM

### RAL CCL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
CCL FLOOR	CCL FLOOR	0.00		TOP BOTTOM

## CURVE DESCRIPTION REPORT

CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:CCL	Nov 29 17:16:17 2018	CASING COLLAR LOCATOR
F1:GR	Nov 29 17:16:17 2018	GAMMA RAY
F1:ISS	Nov 29 17:16:17 2018	INELASTIC SHORT SPACE COUNT RATE
F1:LS	Nov 29 17:16:17 2018	LONG SPACE COUNT RATE
F1:RATO	Nov 29 17:16:17 2018	SHORT/LONG SPACE COUNT RATE RATIO
F1:RICS	Nov 29 17:16:17 2018	SHORT SPACE INELASTIC TO CAPTURE COUNT RATE RATIO (ISS/CSS)
F1:SGFC	Nov 29 17:16:17 2018	BOREHOLE AND DIFFUSION CORRECTED SIGMA
F1:SS	Nov 29 17:16:17 2018	SHORT SPACE COUNT RATE

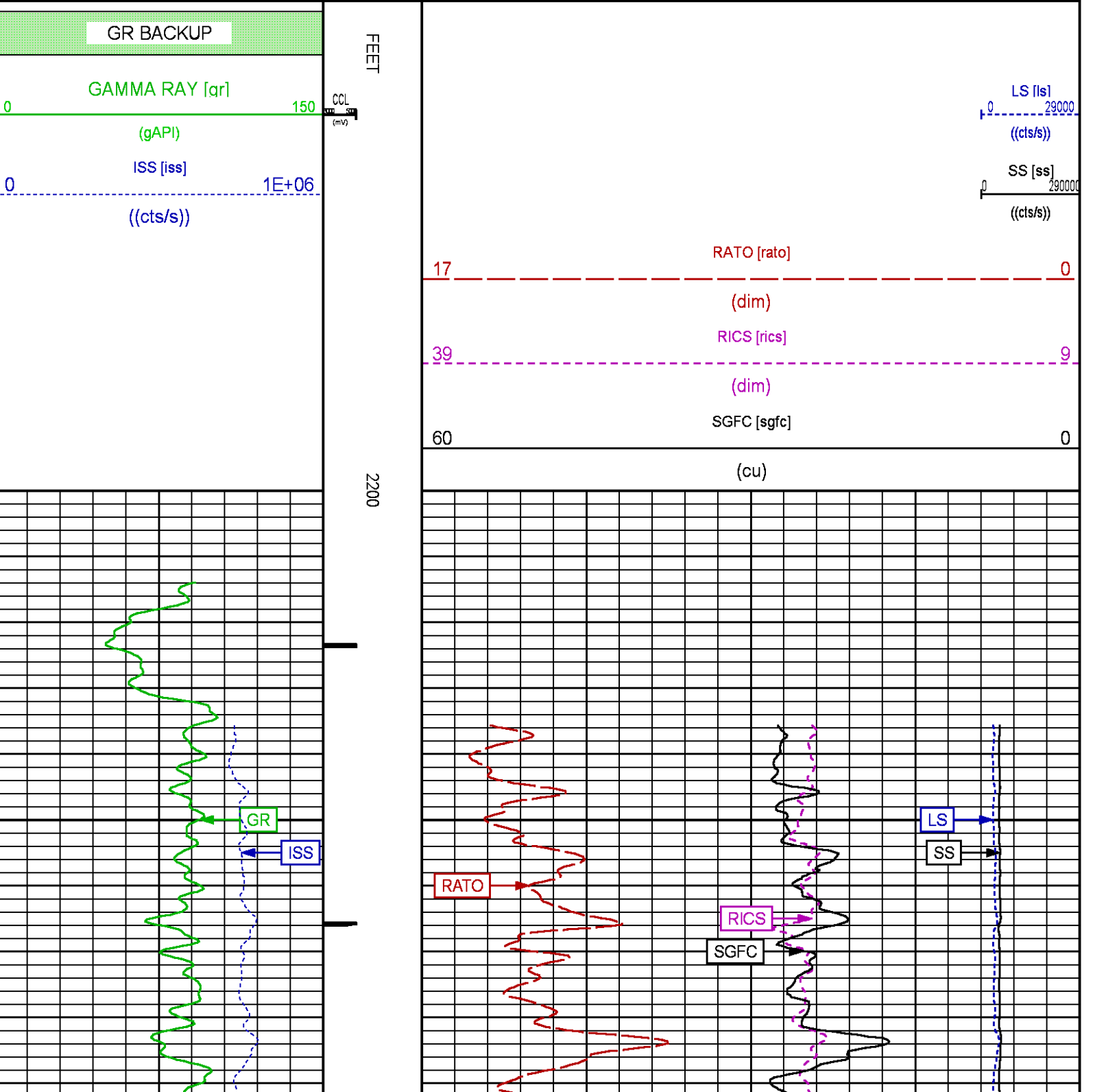
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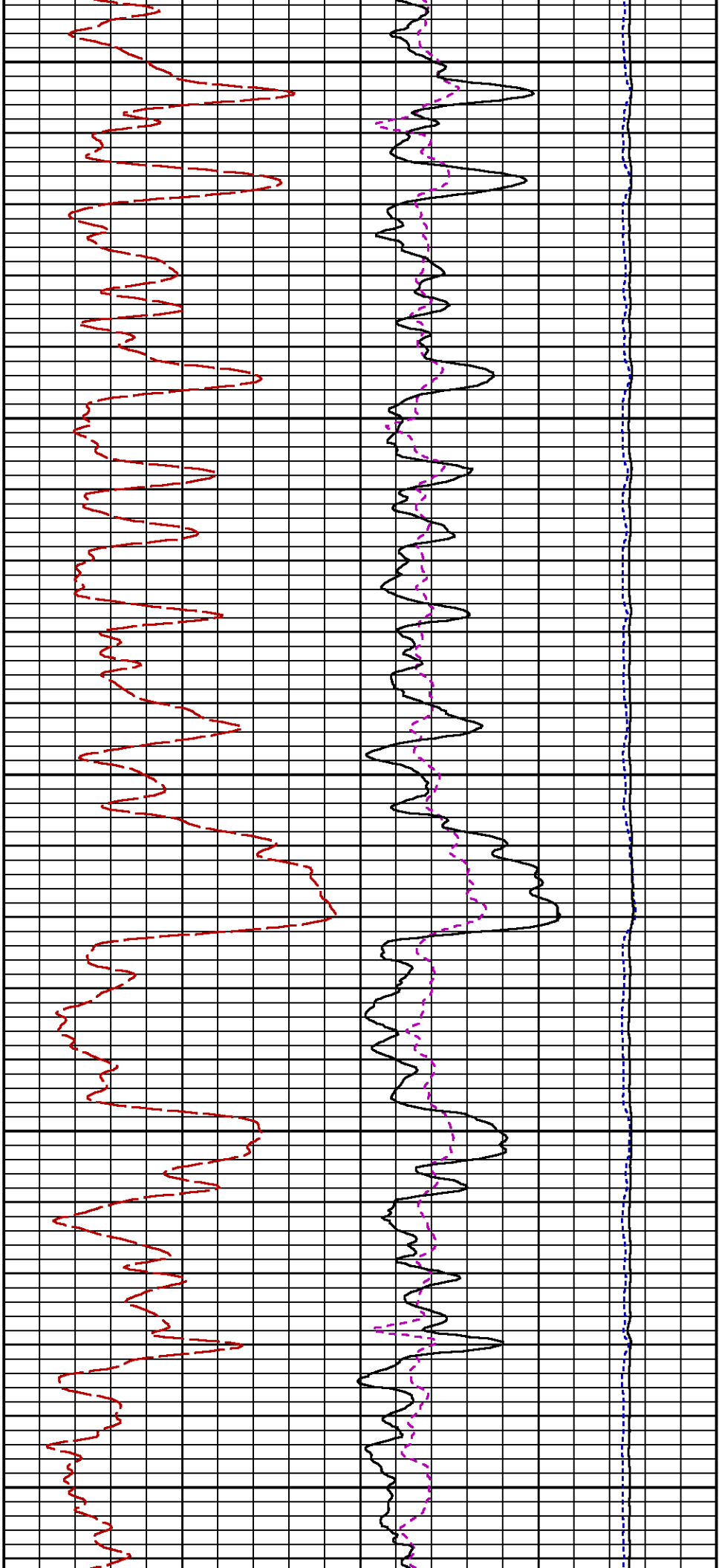
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
CCL	-26.00	ISS	-12.75	RATO	-12.75	SGFC	-12.75
GR	-23.00	LS	-12.75	RICS	-12.75	SS	-12.75

Presentation : SysA:/dat1a/LARAMIE\_BCU\_0993\_21\_02W/02W\_RPM\_GS\_MAIN.fvpdf [5"/100' Scale]  
Plot Interval : 2200 - 2975 Feet

Data File 1 : F1 : SysA:/dat1a/LARAMIE\_BCU\_0993\_21\_02W/RPM\_GS\_MAIN.xtf  
Created On : Nov 29 17:16:17 2018  
Company : LARAMIE ENERGY LLC  
Well : BCU 0993-21-02W  
Field : BUZZARD CREEK  
File Interval : 2209 - 2953 Feet  
OCT : p353h

Data File 2 : F2 : SysA:/dat1a/LARAMIE\_BCU\_0993\_21\_02W/RAL\_MAIN.xtf  
Created On : Nov 29 10:39:35 2018  
Company : LARAMIE ENERGY LLC  
Well : BCU 0993-21-02W  
Field : BUZZARD CREEK  
File Interval : 15.5 - 7650.5 Feet  
OCT : p012g

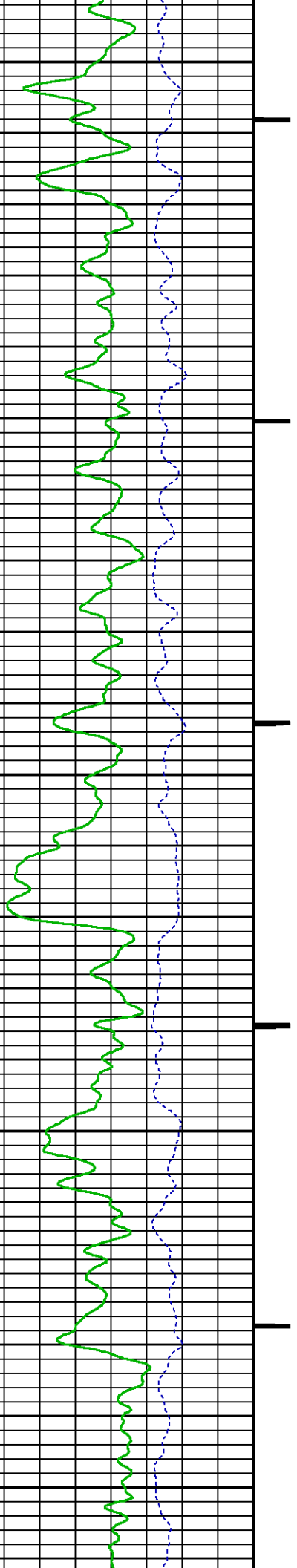


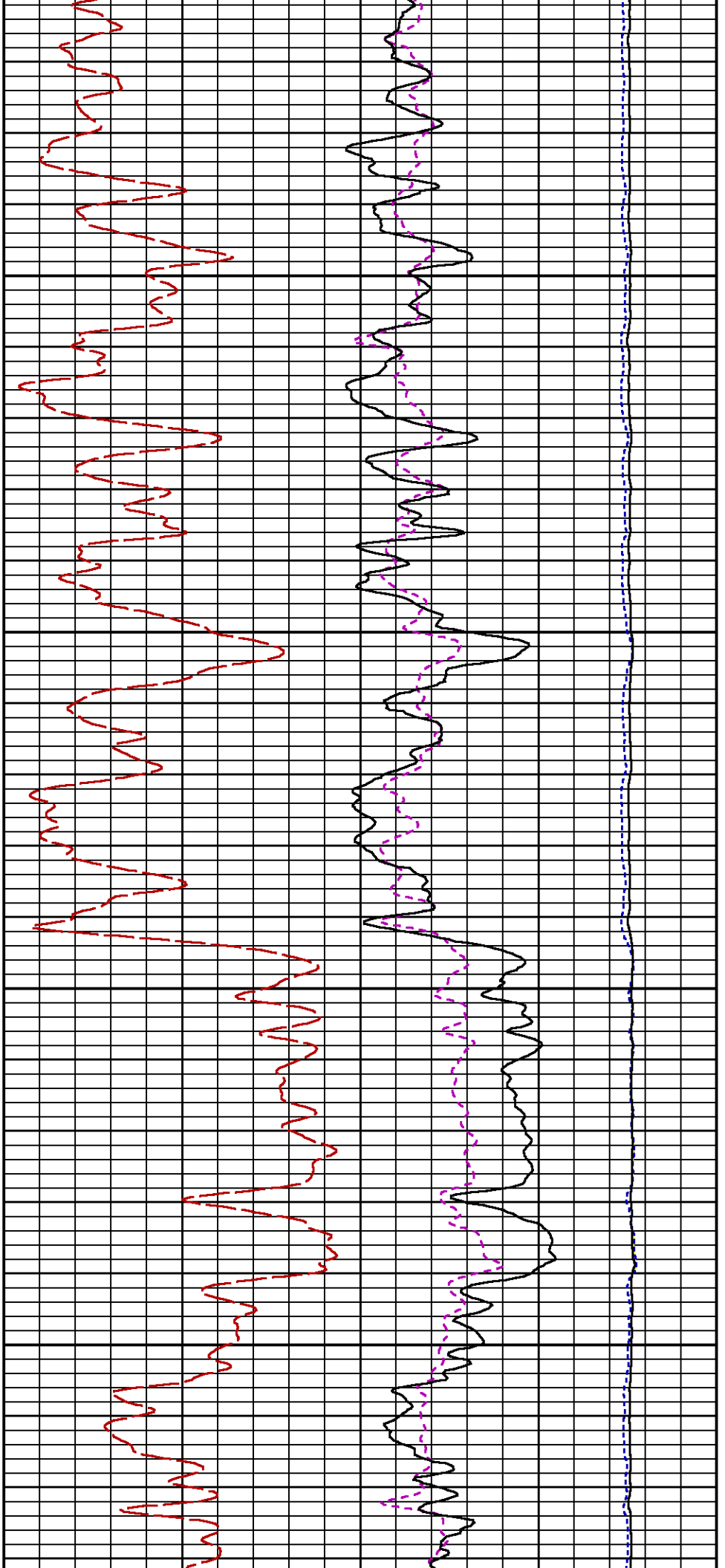


2300

2400

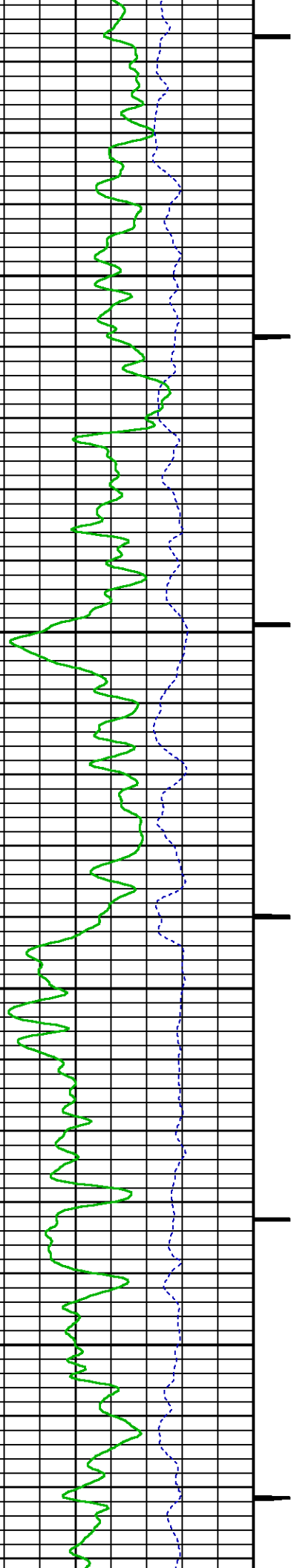
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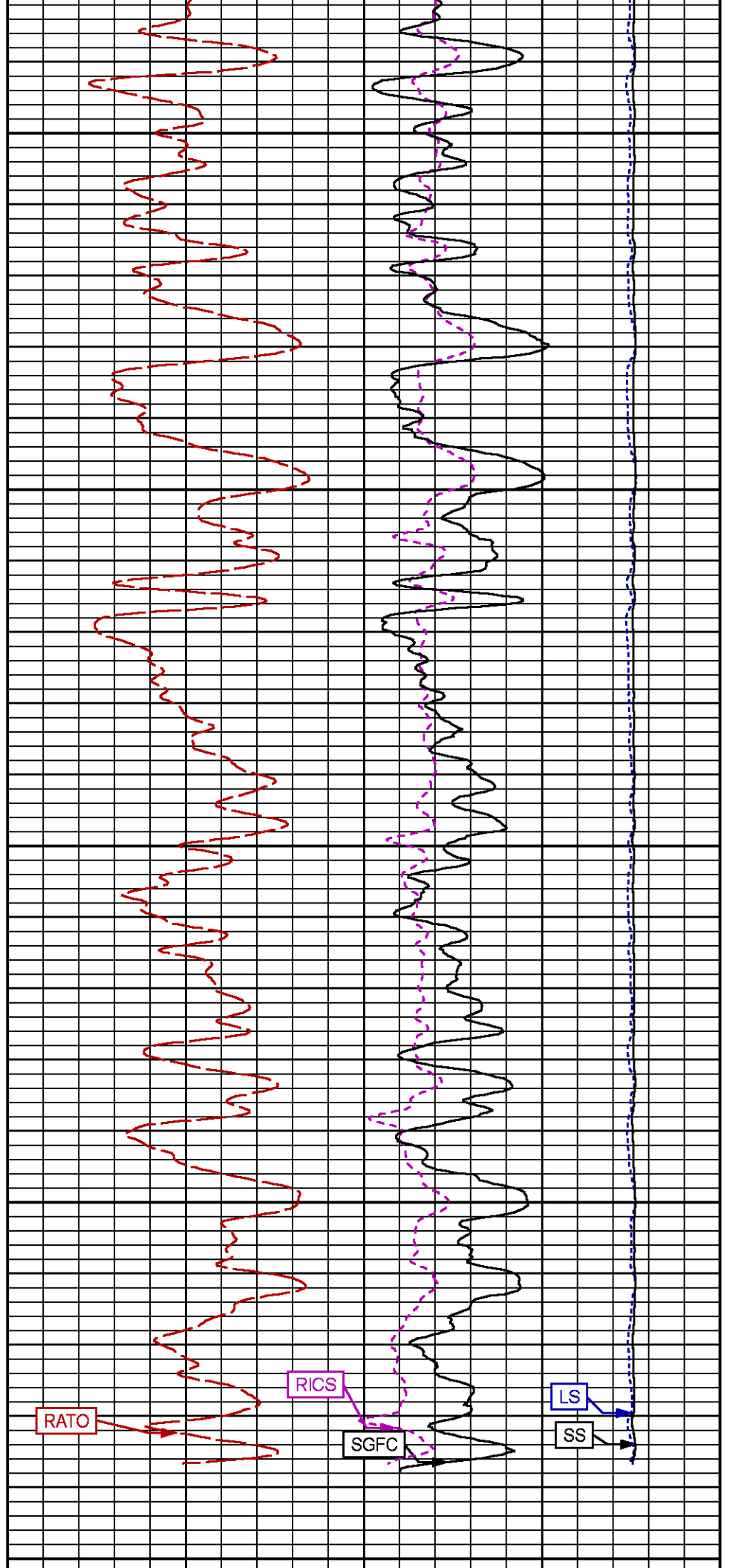
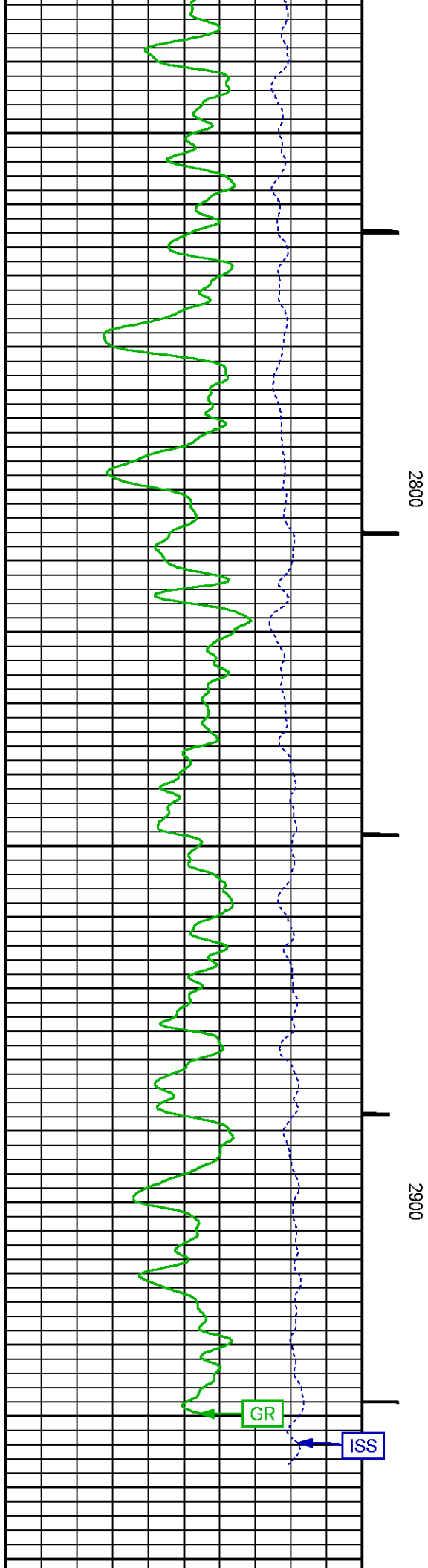


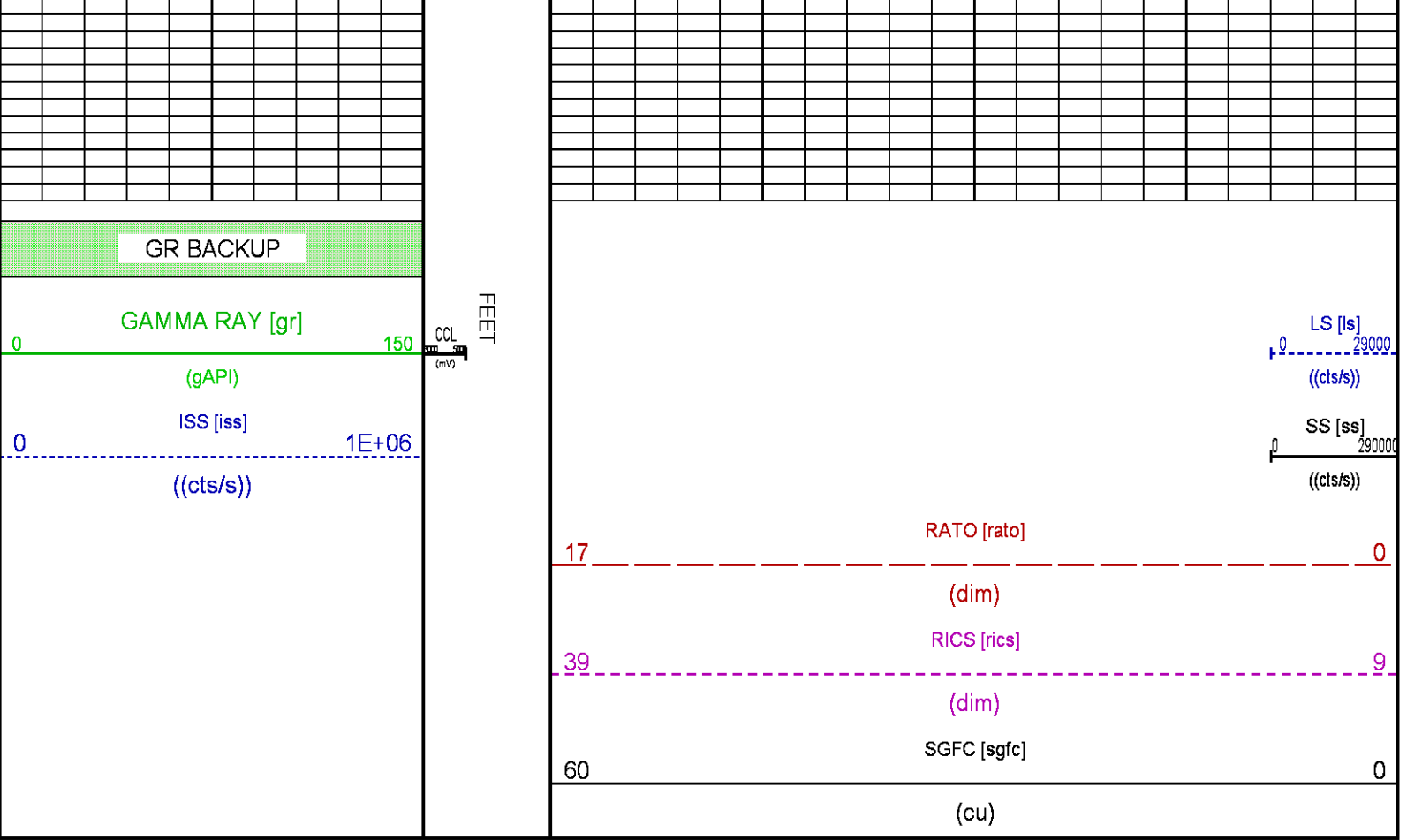


2600

2700







RPM MAIN PASS WILLIAMS FORK

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017  
Updates: 1

Plotted: Thu Nov 29 17:03:04 2018

PARAMETER AND FILTER SUMMARY REPORT				
FILE: /dat1a/LARAMIE_BCU_0993_21_02W/p353h01.prm				
LOGGING MODE: DEPTH DIRECTION: UP				
TOP DEPTH: 4670.647 ft BOTTOM DEPTH: 4999.029 ft				
SYMMETRIC FILTER				
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
GR	FILTER ()	medium (1)		TOP BOTTOM
RPM PROCESSING				
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
PNC Parameters	BOREHOLE CONTENTS	FLUID		TOP BOTTOM
	OPEN/CASED HOLE	CASED HOLE		" "
	BOREHOLE SIZE	7.88	in	" "
	LARGEST CASING OD	4.50	in	" "
	MATRIX	SANDSTONE		" "

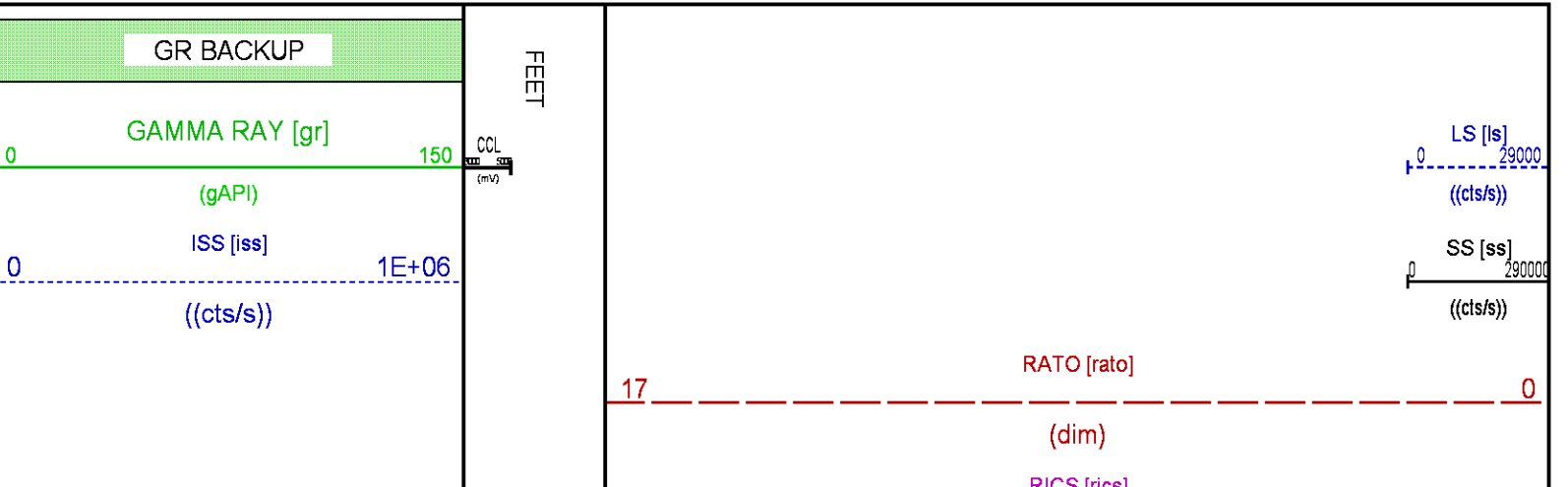
PARAMETER AND FILTER SUMMARY REPORT

SYMMETRIC FILTER				
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
GR	FILTER ( )	medium (1)		TOP BOTTOM
RPM PROCESSING				
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
PNC Parameters	BOREHOLE CONTENTS	FLUID		TOP BOTTOM
	OPEN/CASED HOLE	CASED HOLE		" "
	BOREHOLE SIZE	7.88	in	" "
	LARGEST CASING OD	4.50	in	" "
	MATRIX	SANDSTONE		" "

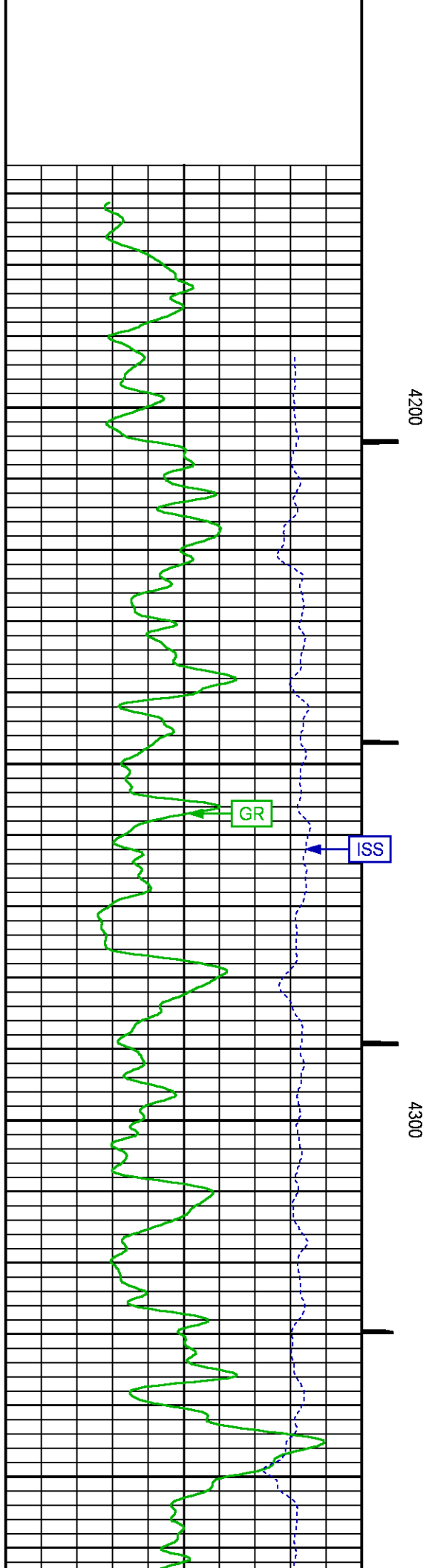
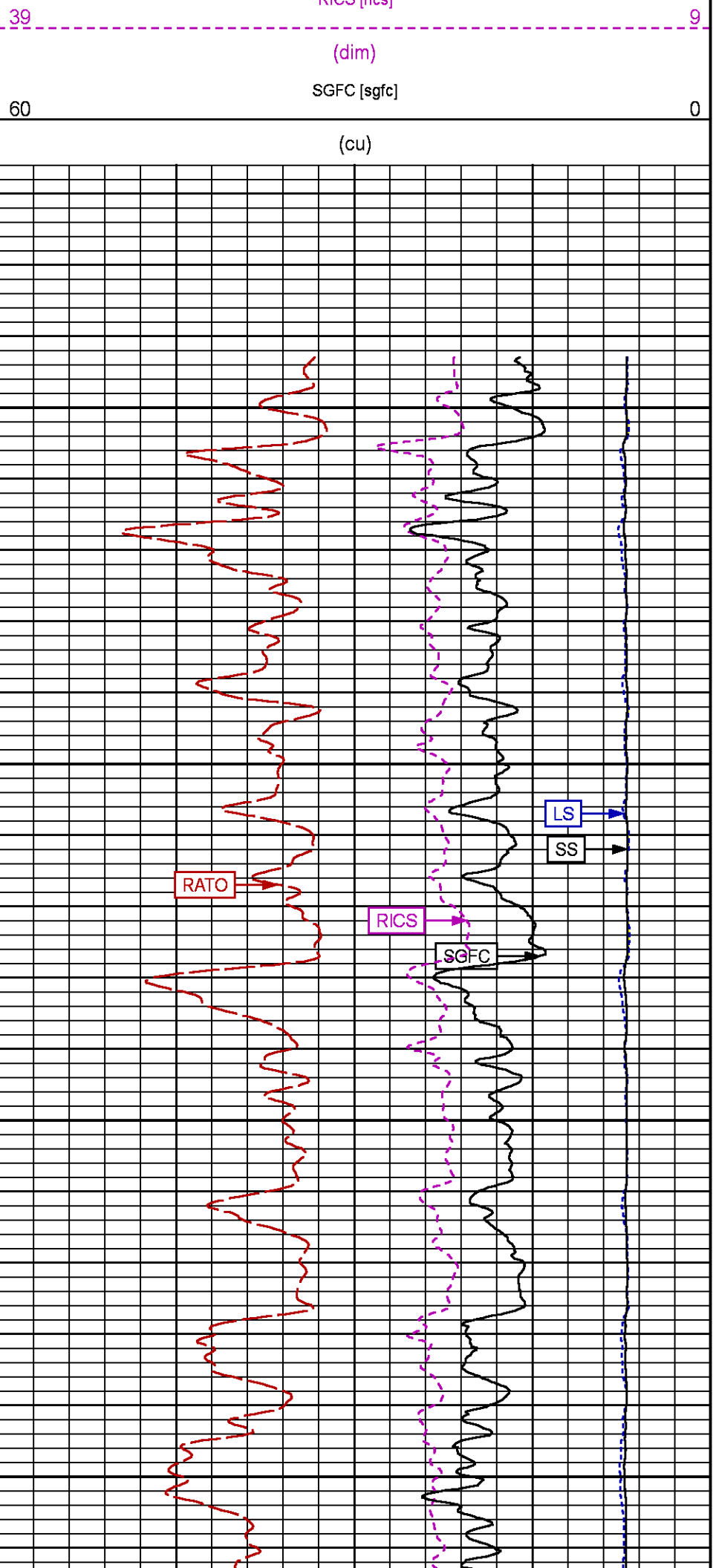
CURVE DESCRIPTION REPORT		
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:CCL	Nov 29 12:45:02 2018	CASING COLLAR LOCATOR
F1:GR	Nov 29 12:45:02 2018	GAMMA RAY
F1:ISS	Nov 29 12:45:02 2018	INELASTIC SHORT SPACE COUNT RATE
F1:LS	Nov 29 12:45:02 2018	LONG SPACE COUNT RATE
F1:RATO	Nov 29 12:45:02 2018	SHORT/LONG SPACE COUNT RATE RATIO
F1:RICS	Nov 29 12:45:02 2018	SHORT SPACE INELASTIC TO CAPTURE COUNT RATE RATIO (ISS/CSS)
F1:SGFC	Nov 29 12:45:02 2018	BOREHOLE AND DIFFUSION CORRECTED SIGMA
F1:SS	Nov 29 12:45:02 2018	SHORT SPACE COUNT RATE

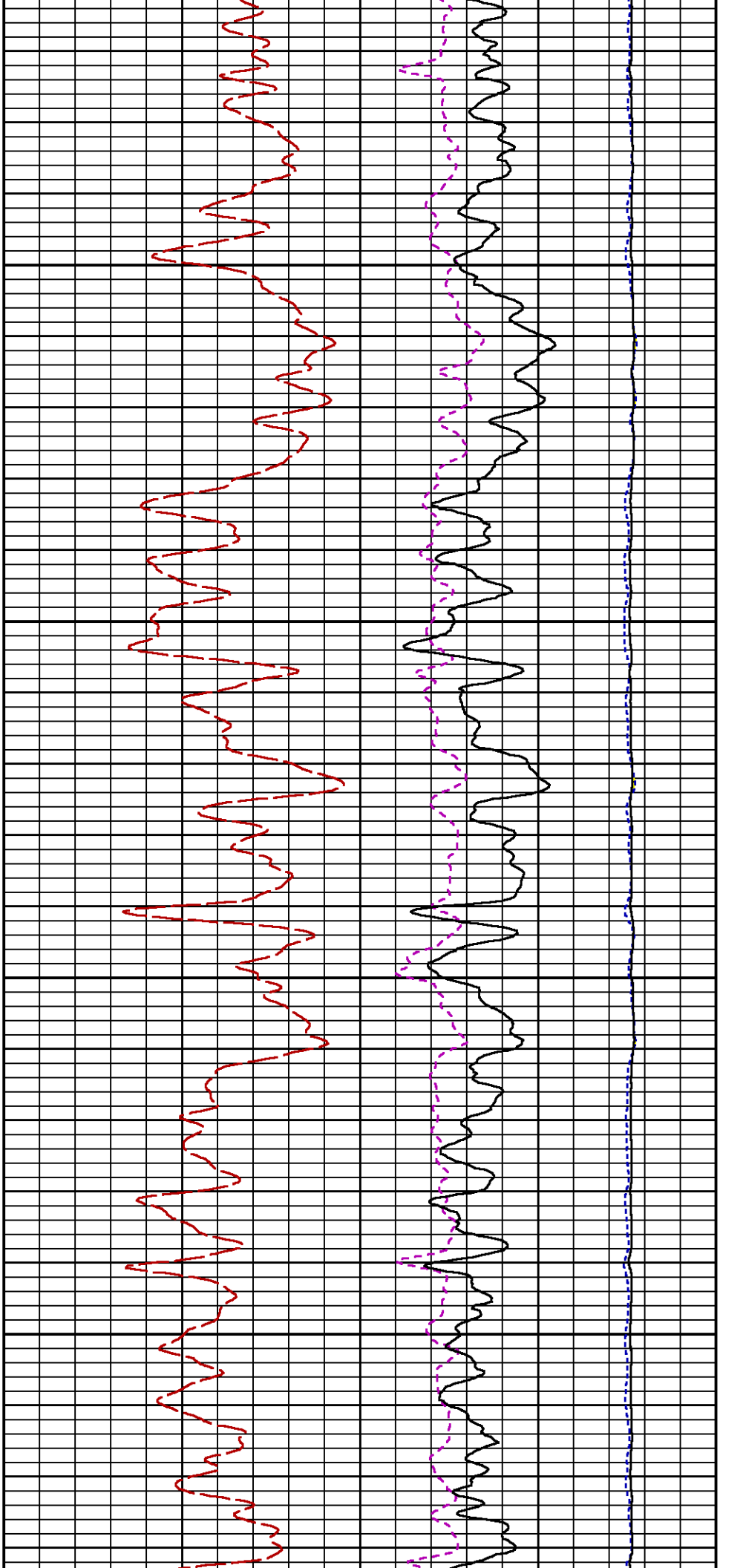
CURVE MEASURE POINT OFFSET					
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
CCL	-26.00	ISS	-12.75	RATO	-12.75
GR	-23.00	LS	-12.75	RICS	-12.75
				SGFC	-12.75
				SS	-12.75

Presentation	: SysA:/dat1a/LARAMIE_BCU_0993_21_02W/02W_RPM_WF_MAIN.fvpdf [5"/100' Scale]
Plot Interval	: 4167 - 7649.5 Feet
Data File 1	: F1 : SysA:/dat1a/LARAMIE_BCU_0993_21_02W/RPM_WF_MAIN.xtf
Created On	: Nov 29 12:45:02 2018
Company	: LARAMIE ENERGY LLC
Well	: BCU 0993-21-02W
Field	: BUZZARD CREEK
File Interval	: 4166.25 - 7649.75 Feet
OCT	: p353h
Data File 2	: F2 : SysA:/dat1a/LARAMIE_BCU_0993_21_02W/RPM_WF_REPEAT.xtf
Created On	: Nov 29 12:45:02 2018
Company	: LARAMIE ENERGY LLC
Well	: BCU 0993-21-02W
Field	: BUZZARD CREEK
File Interval	: 4647.75 - 4999.5 Feet
OCT	: p353h



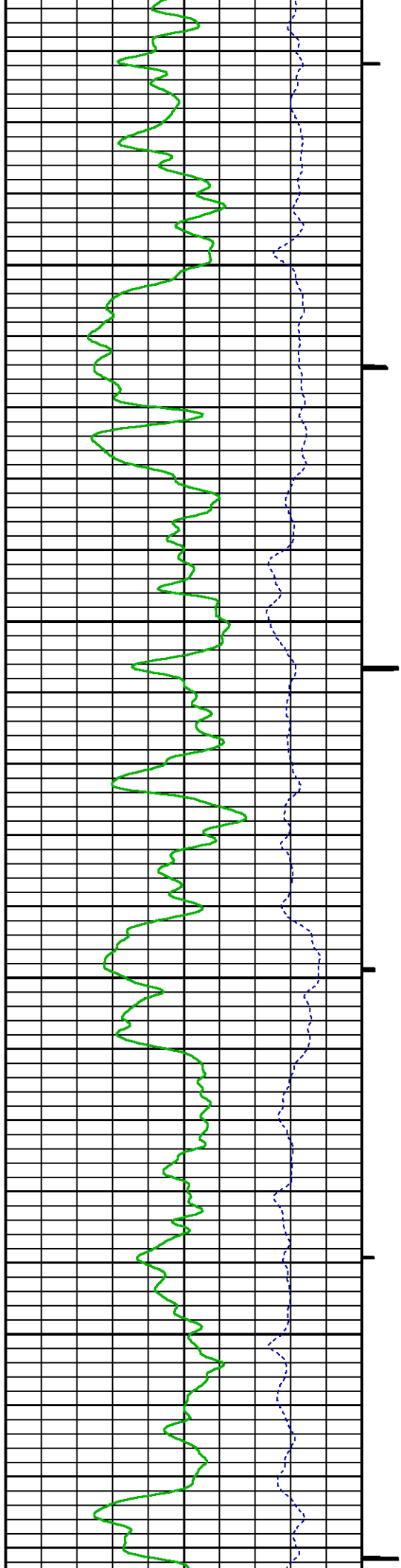


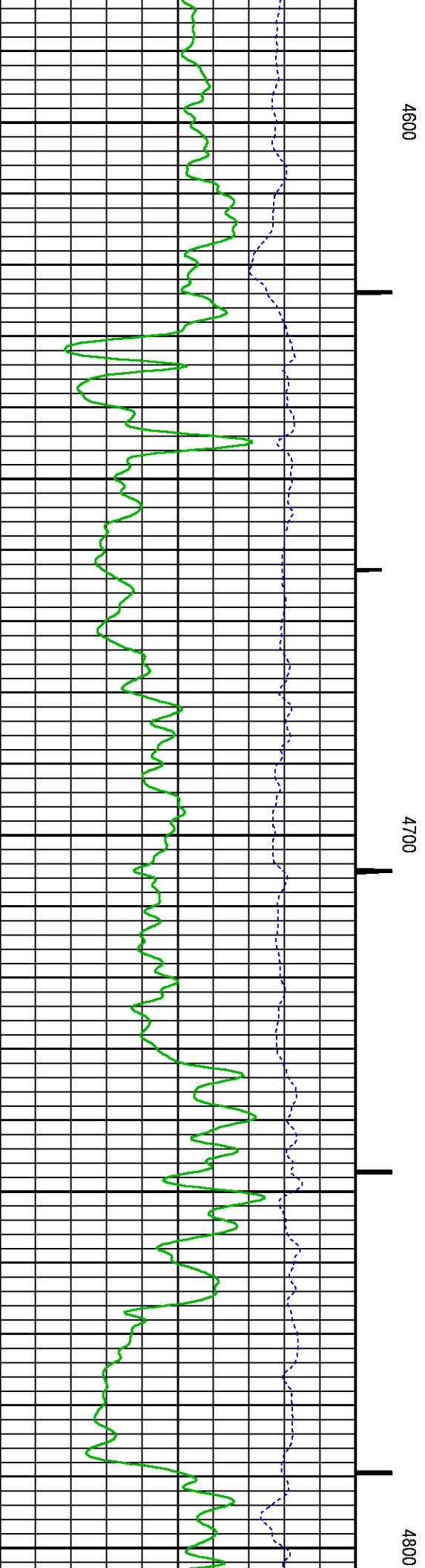
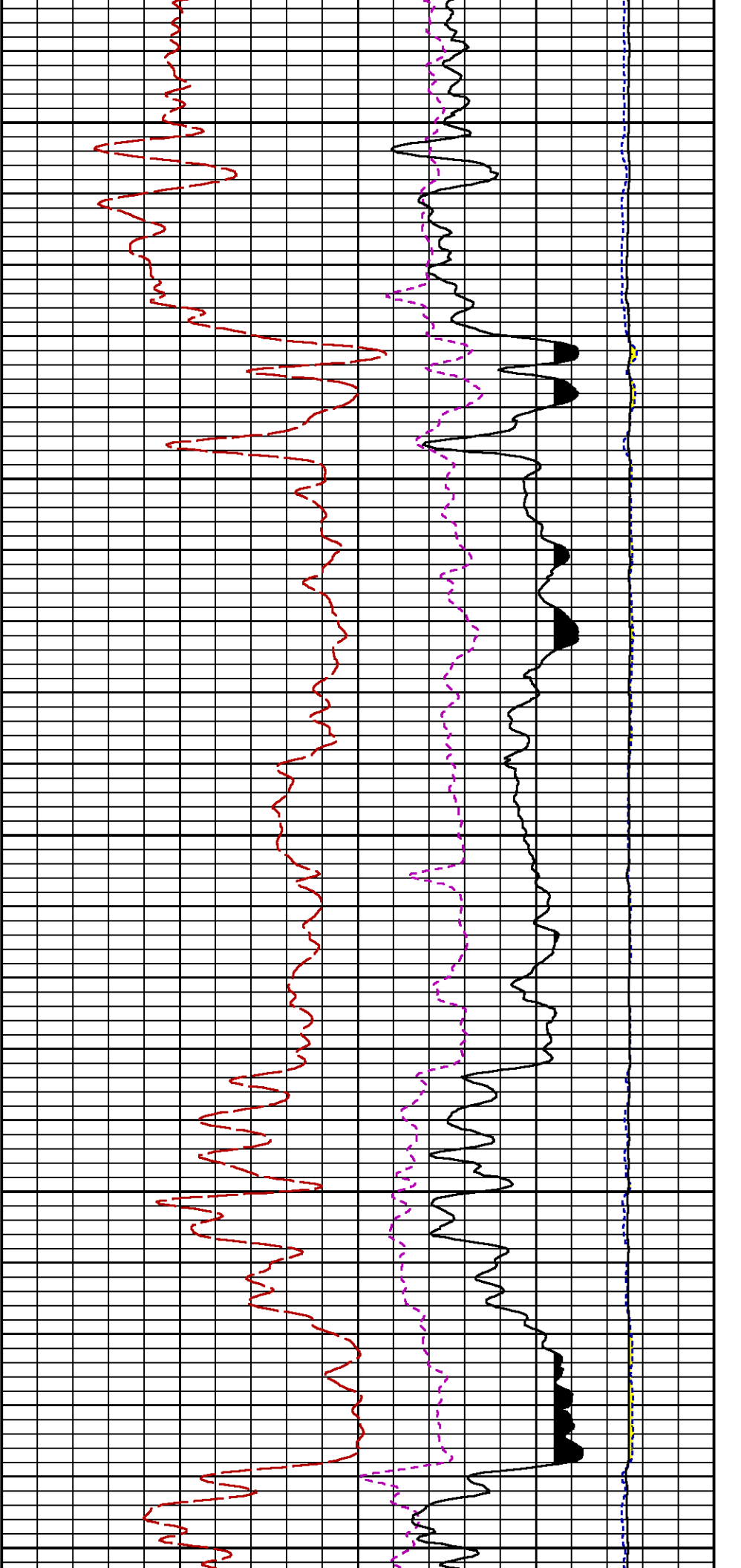


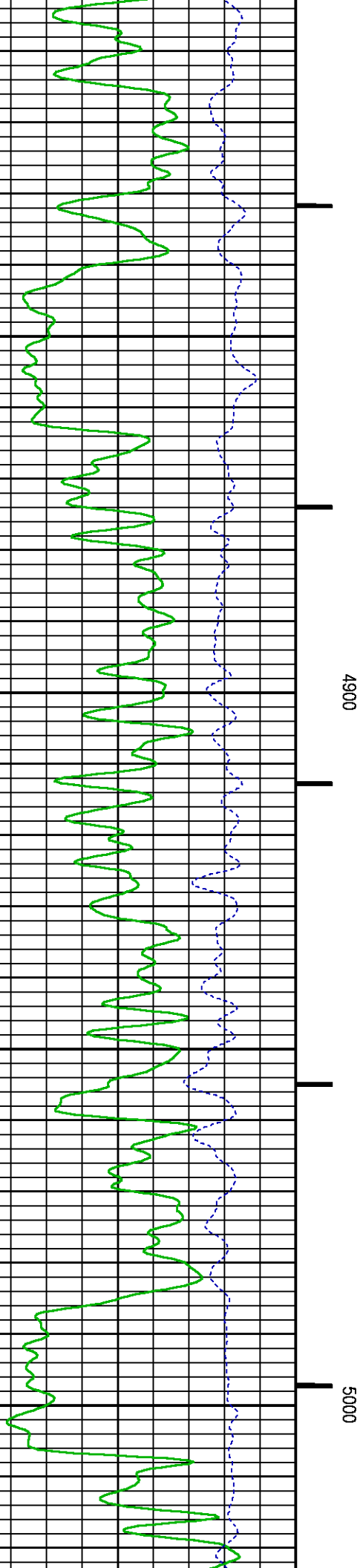
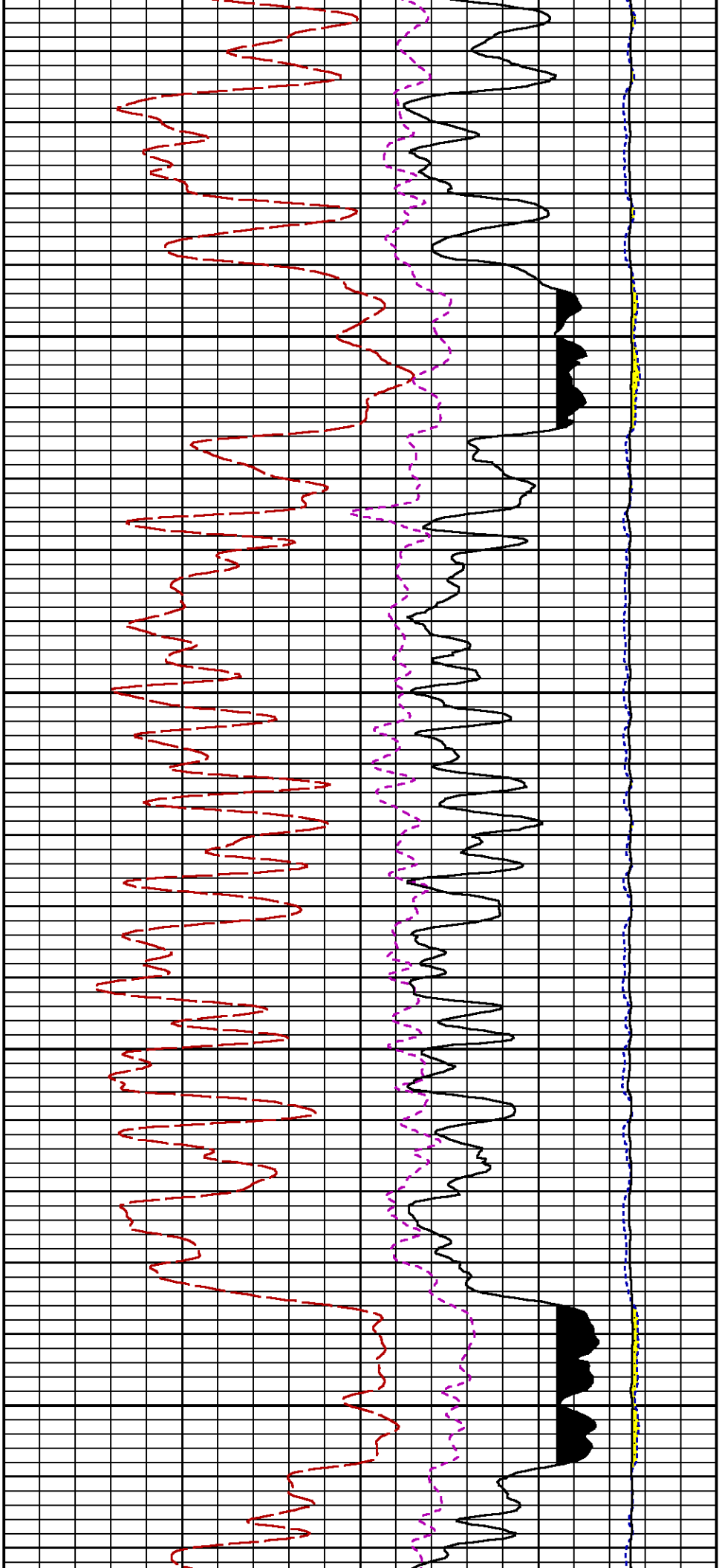


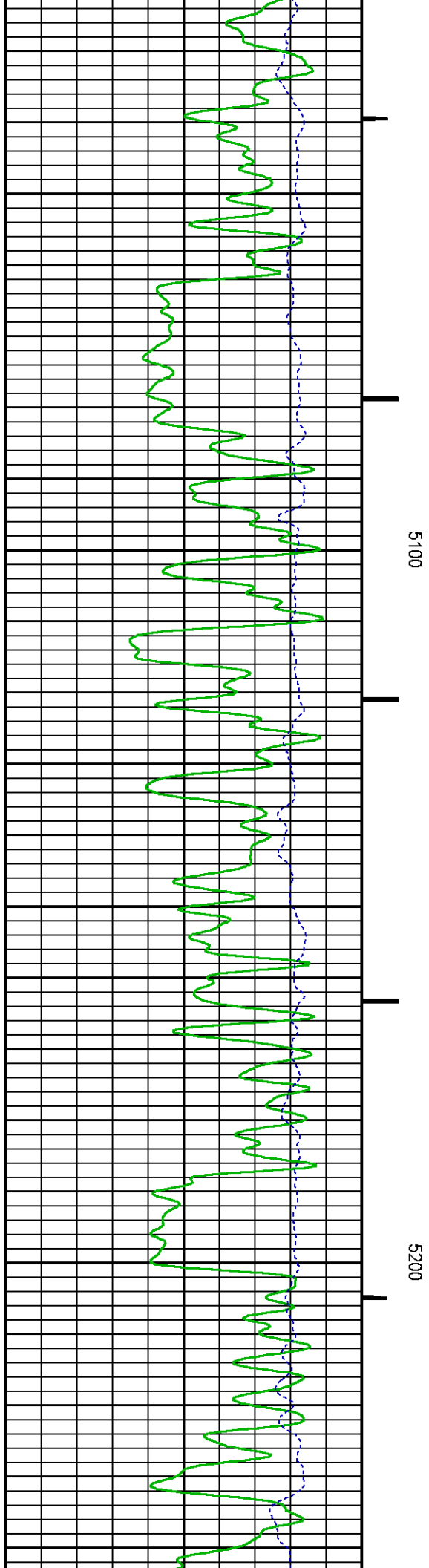
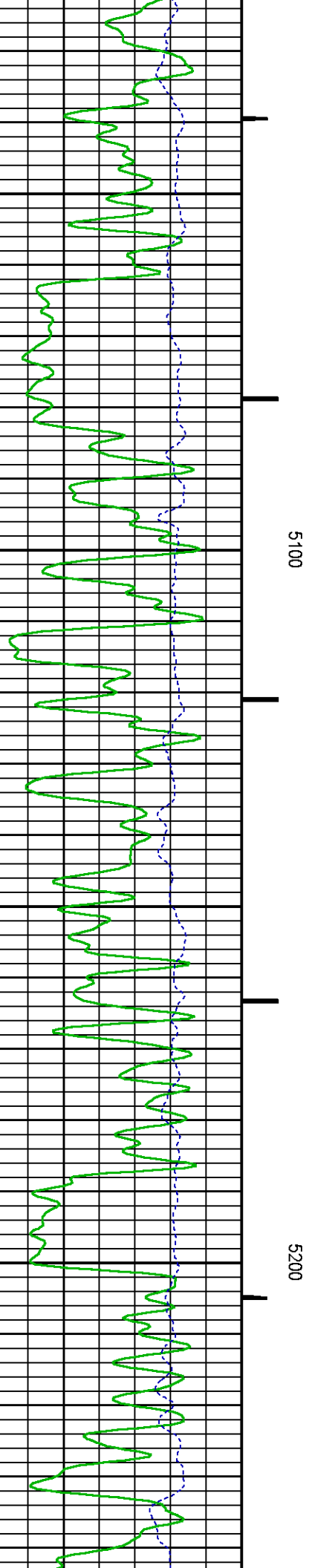
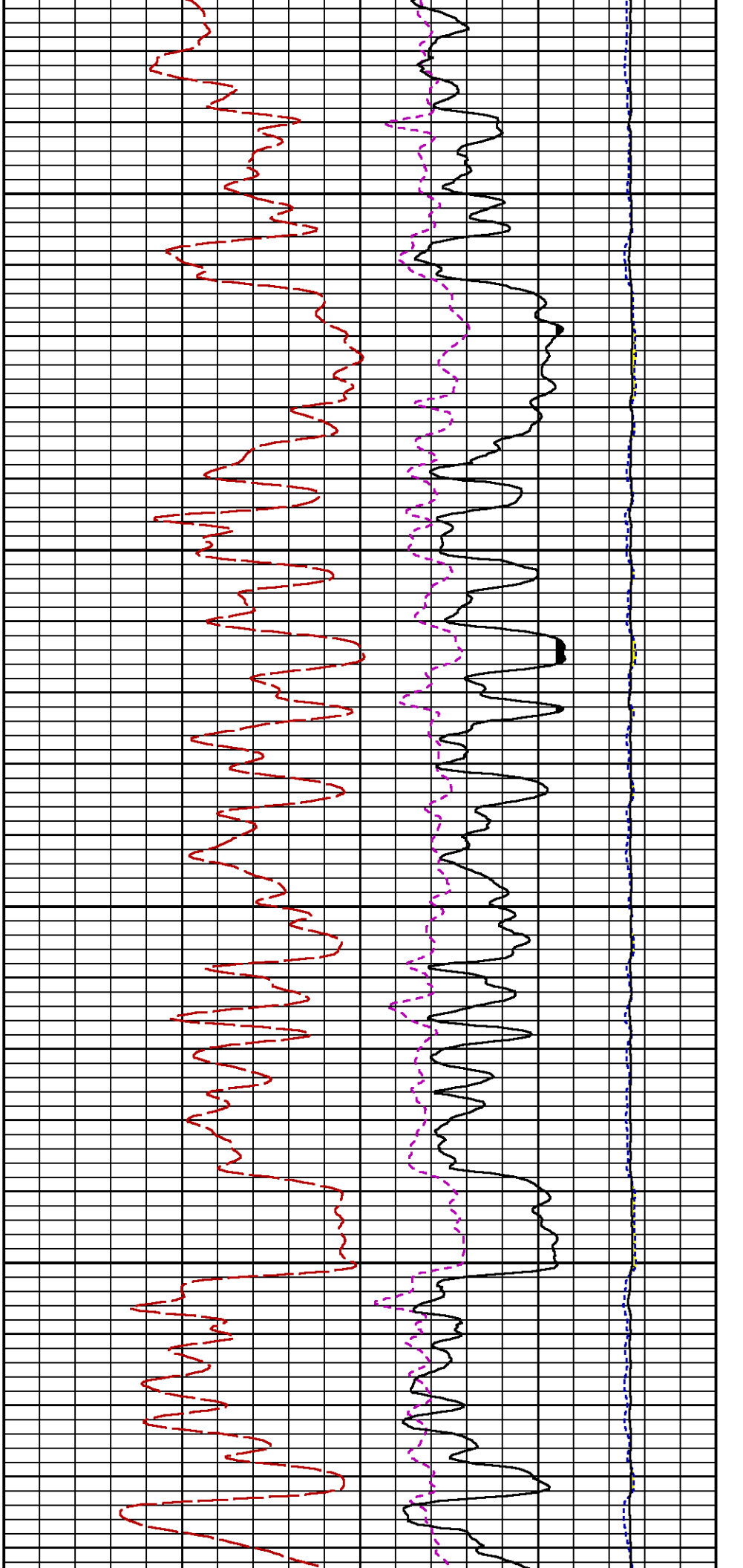
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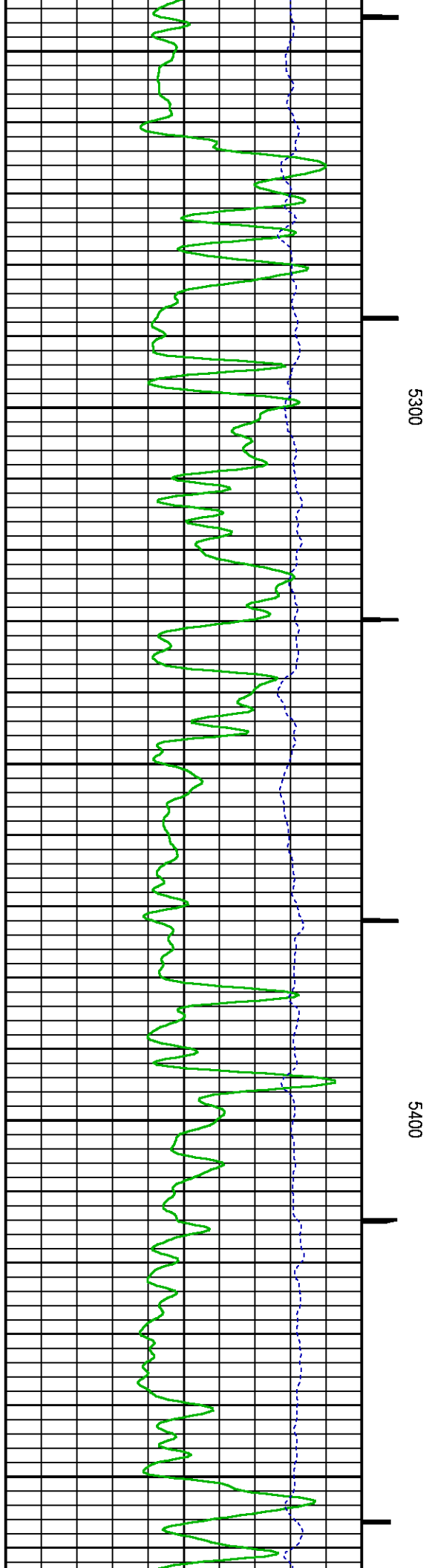
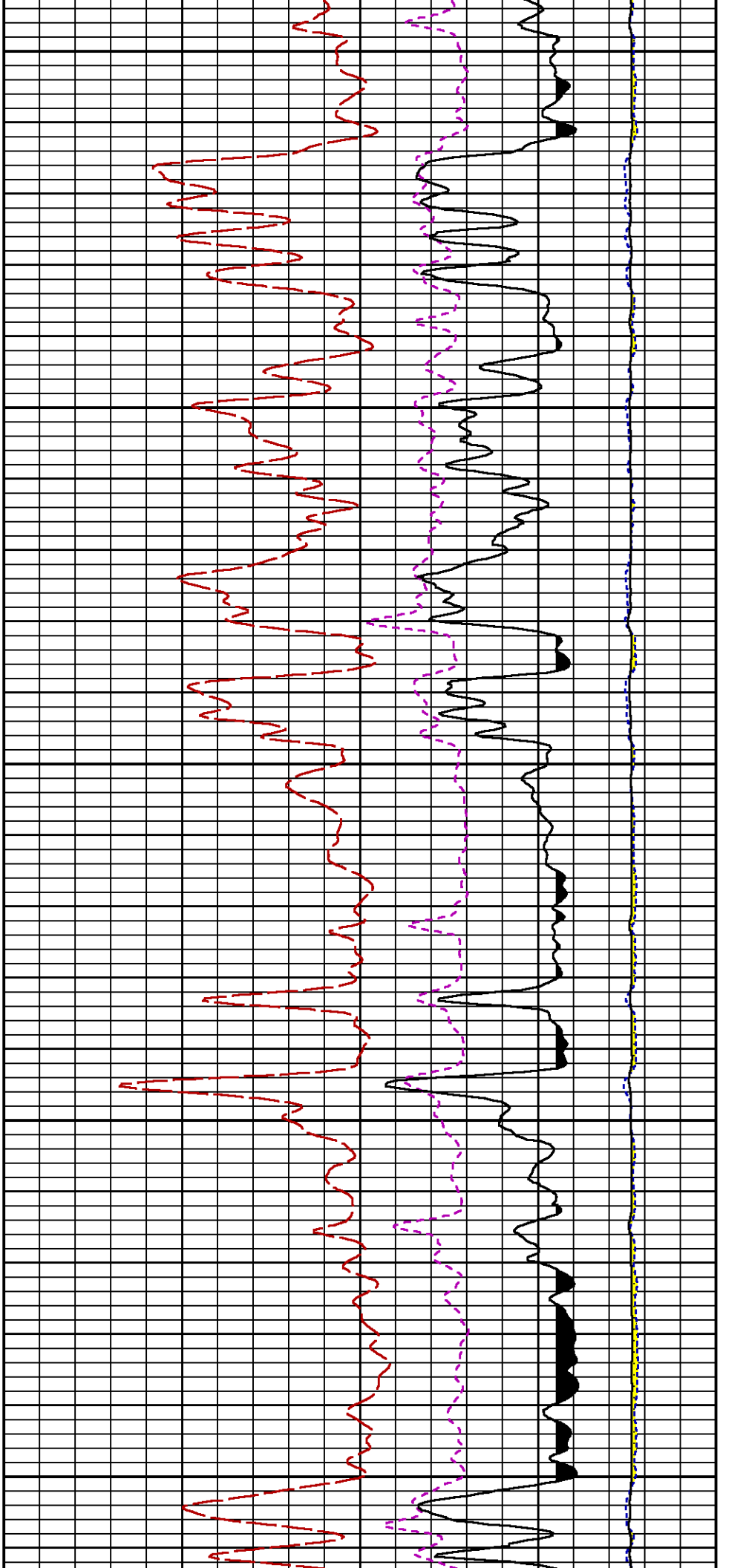
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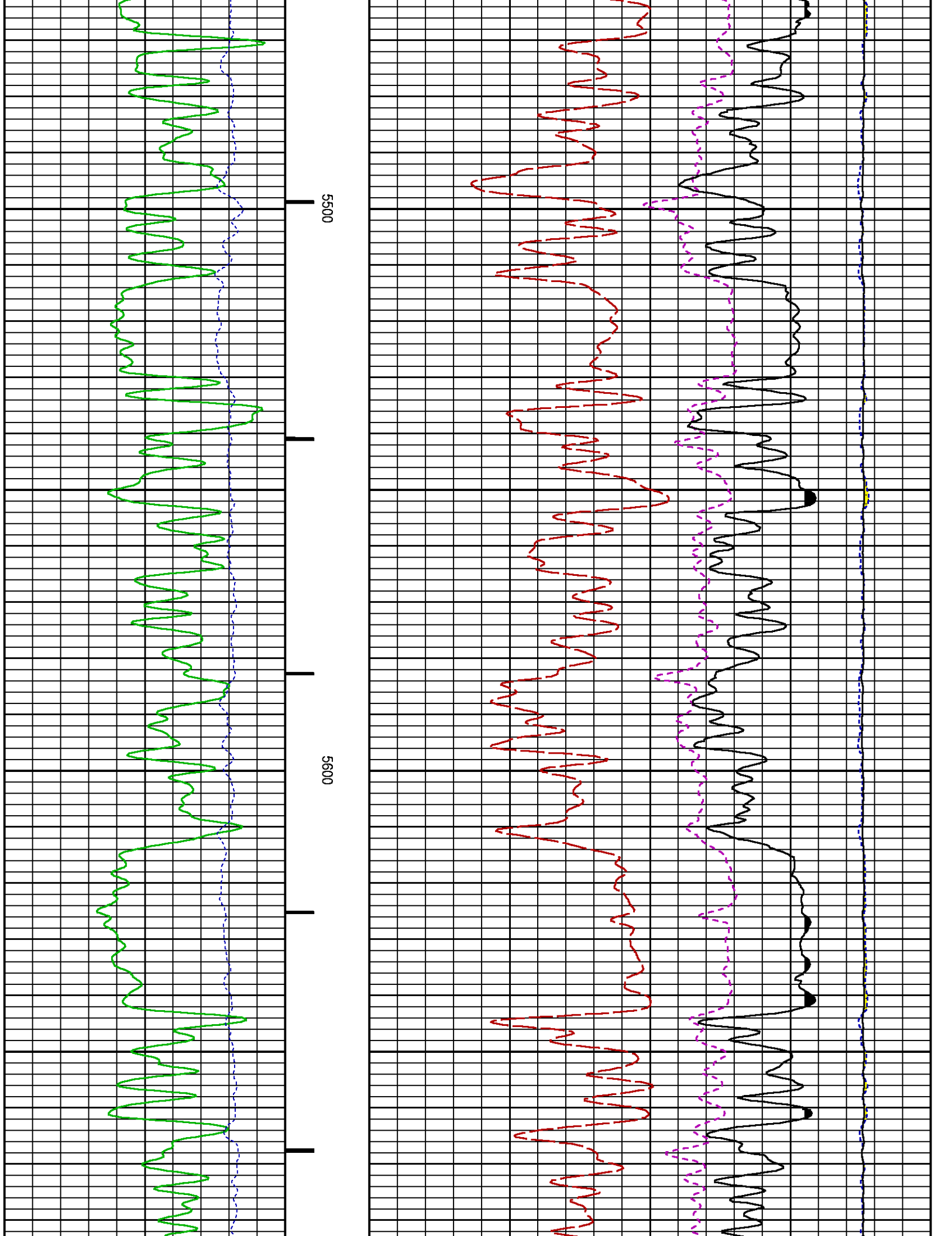


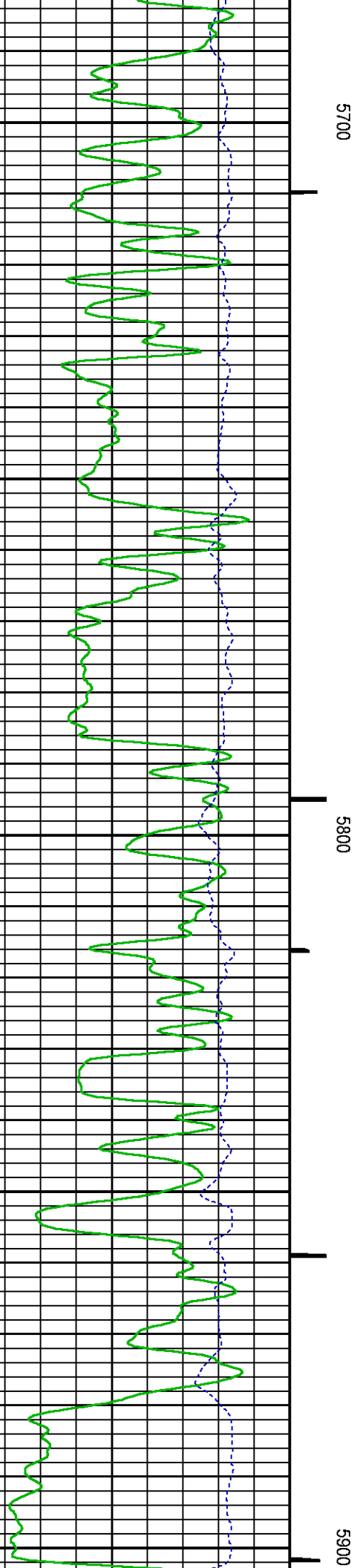
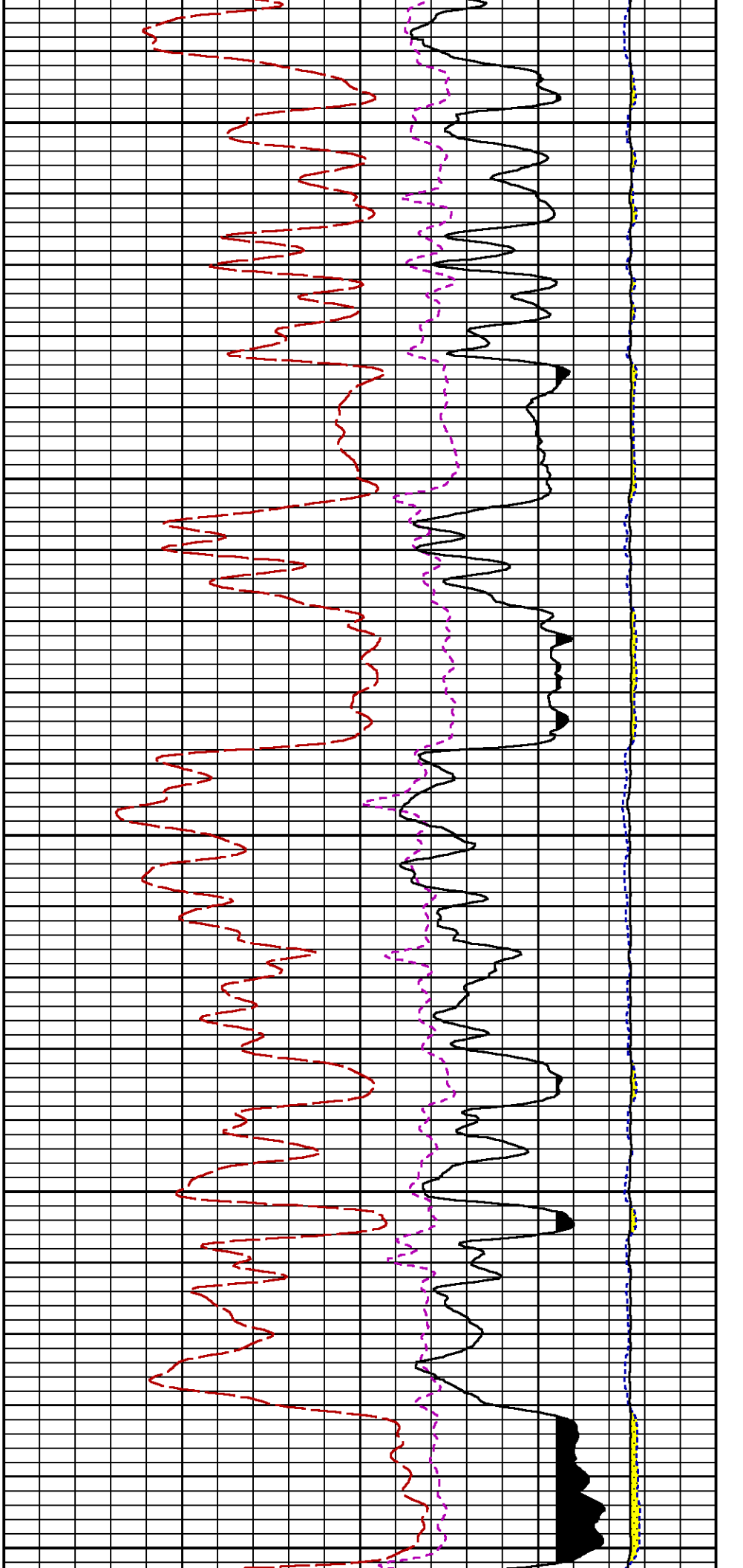




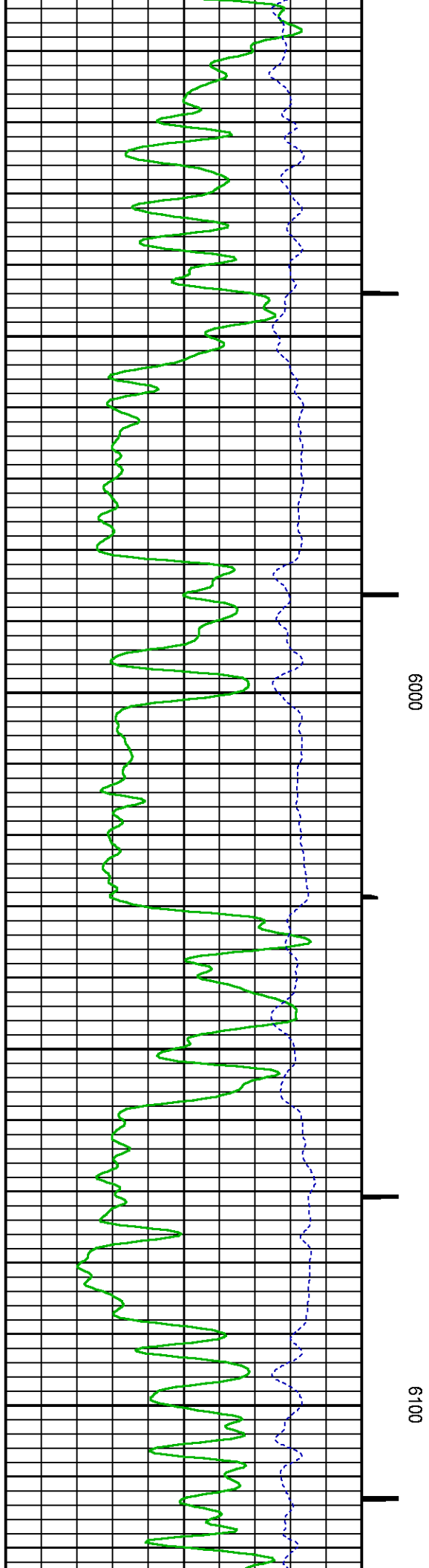
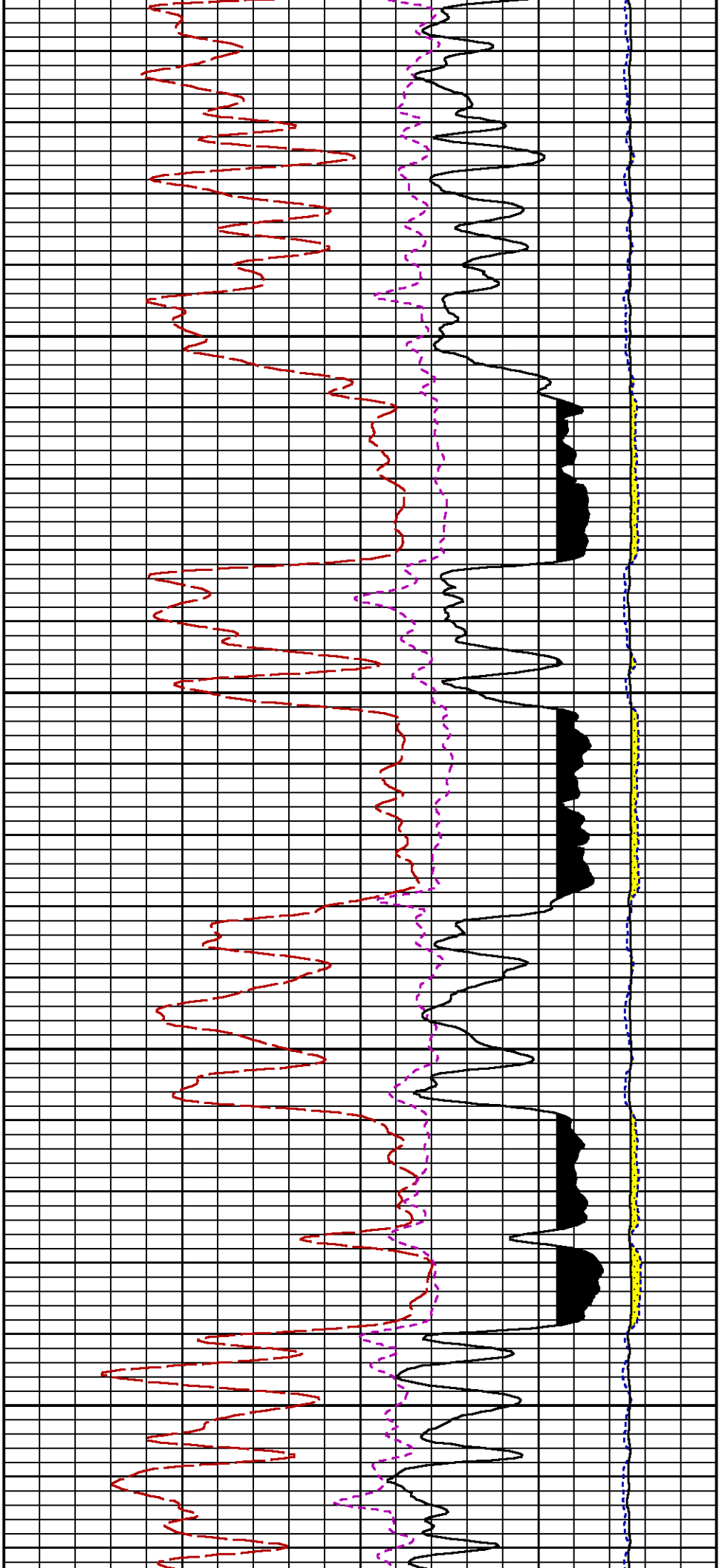


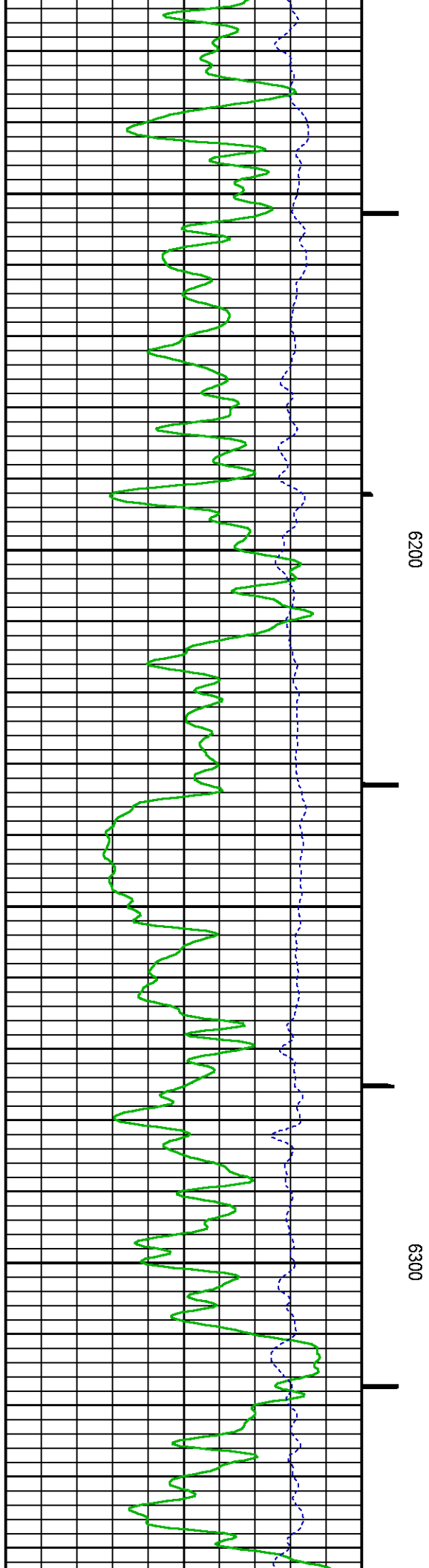
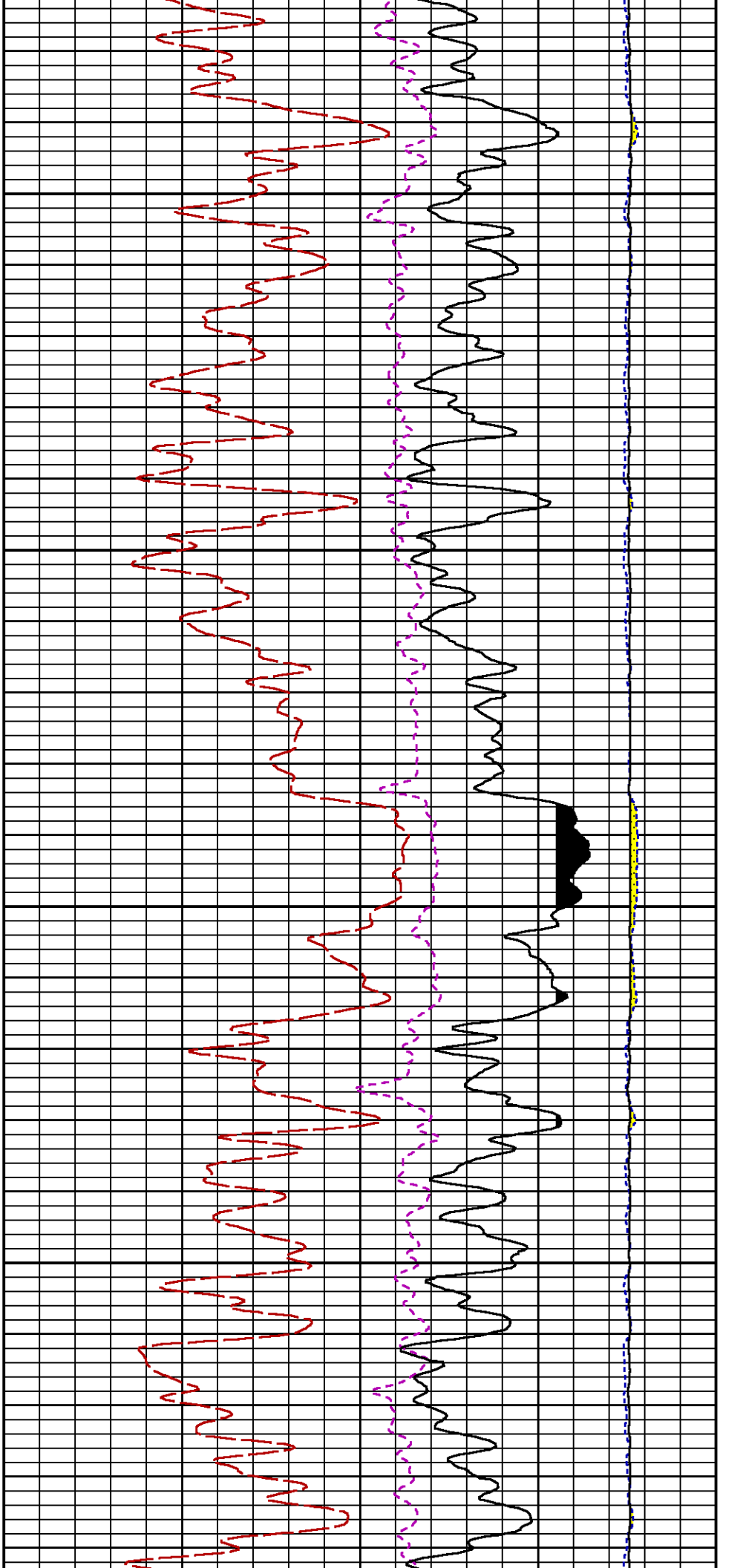


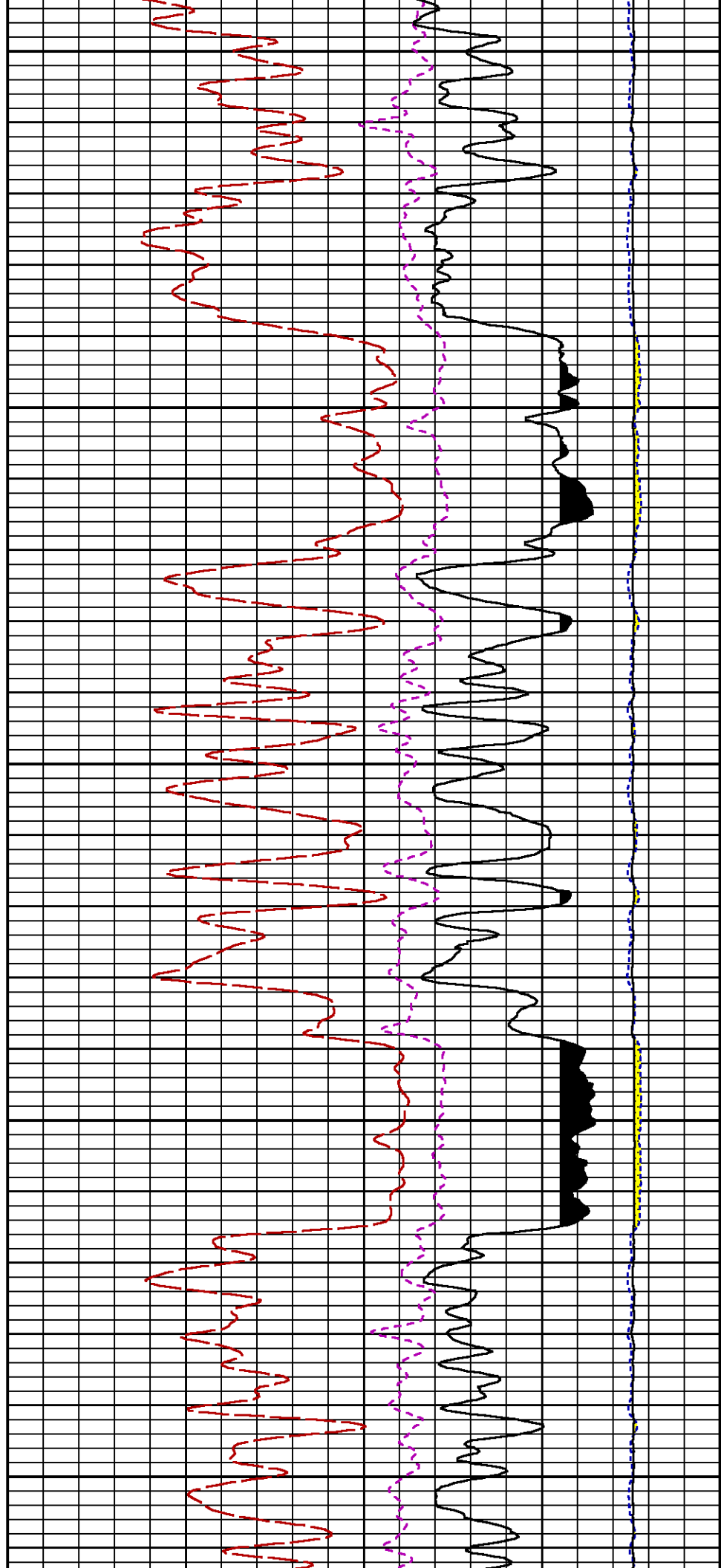
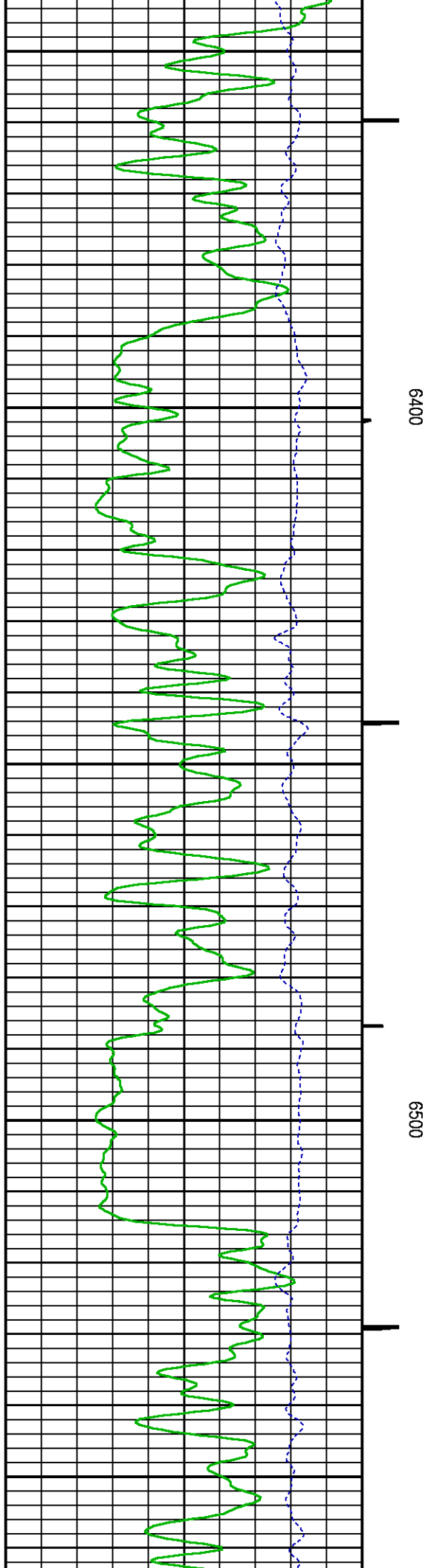


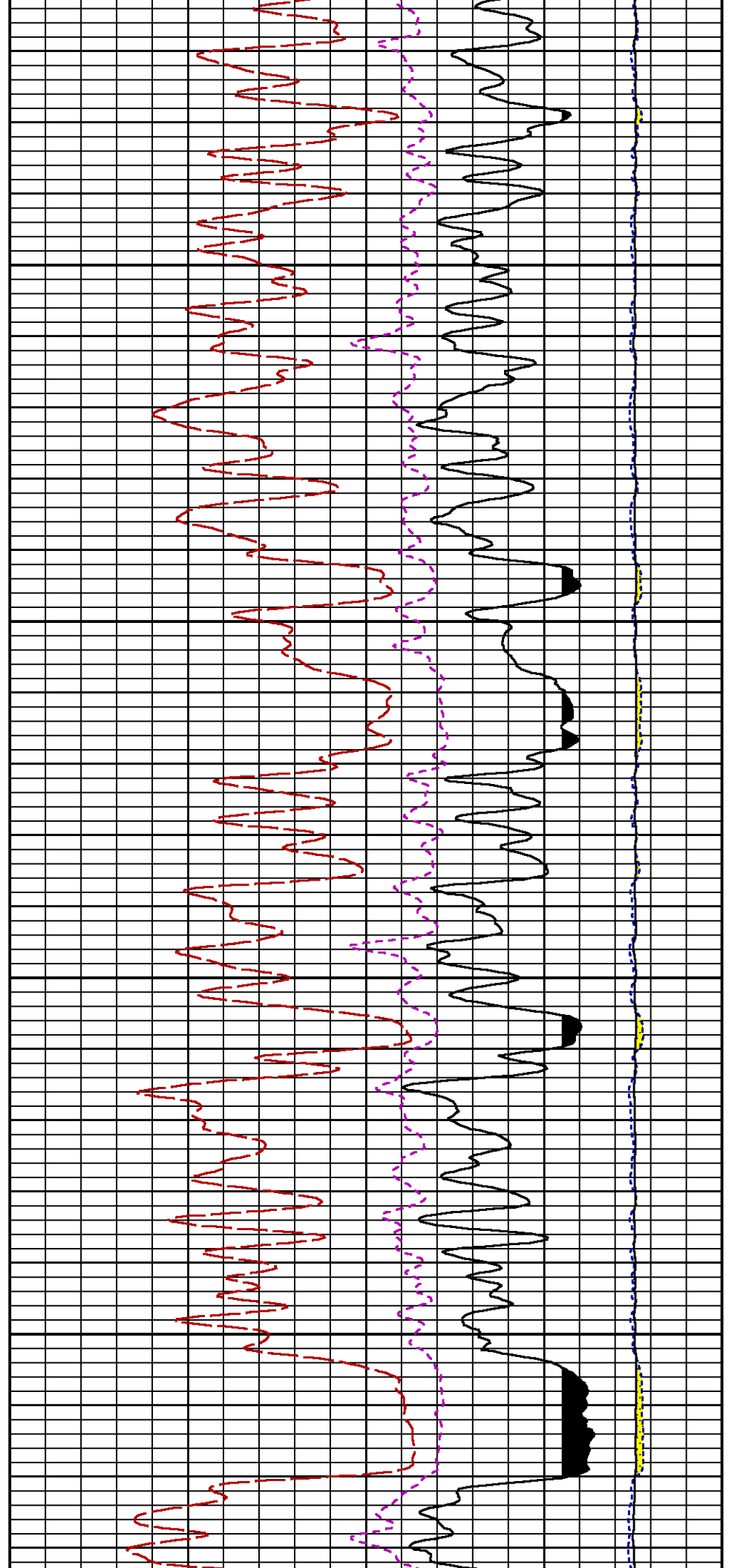
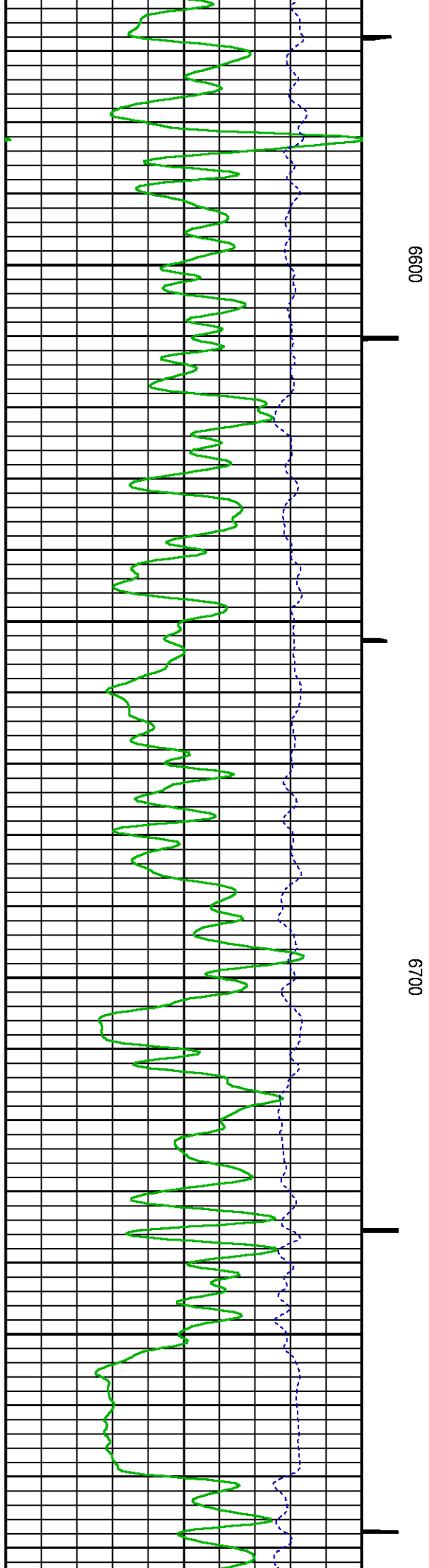


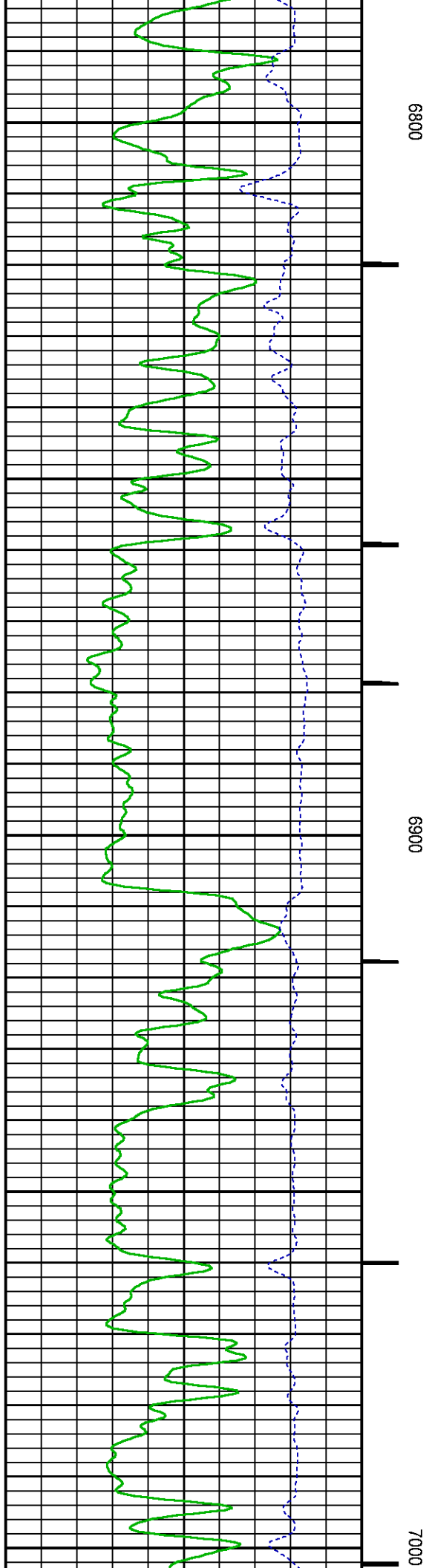
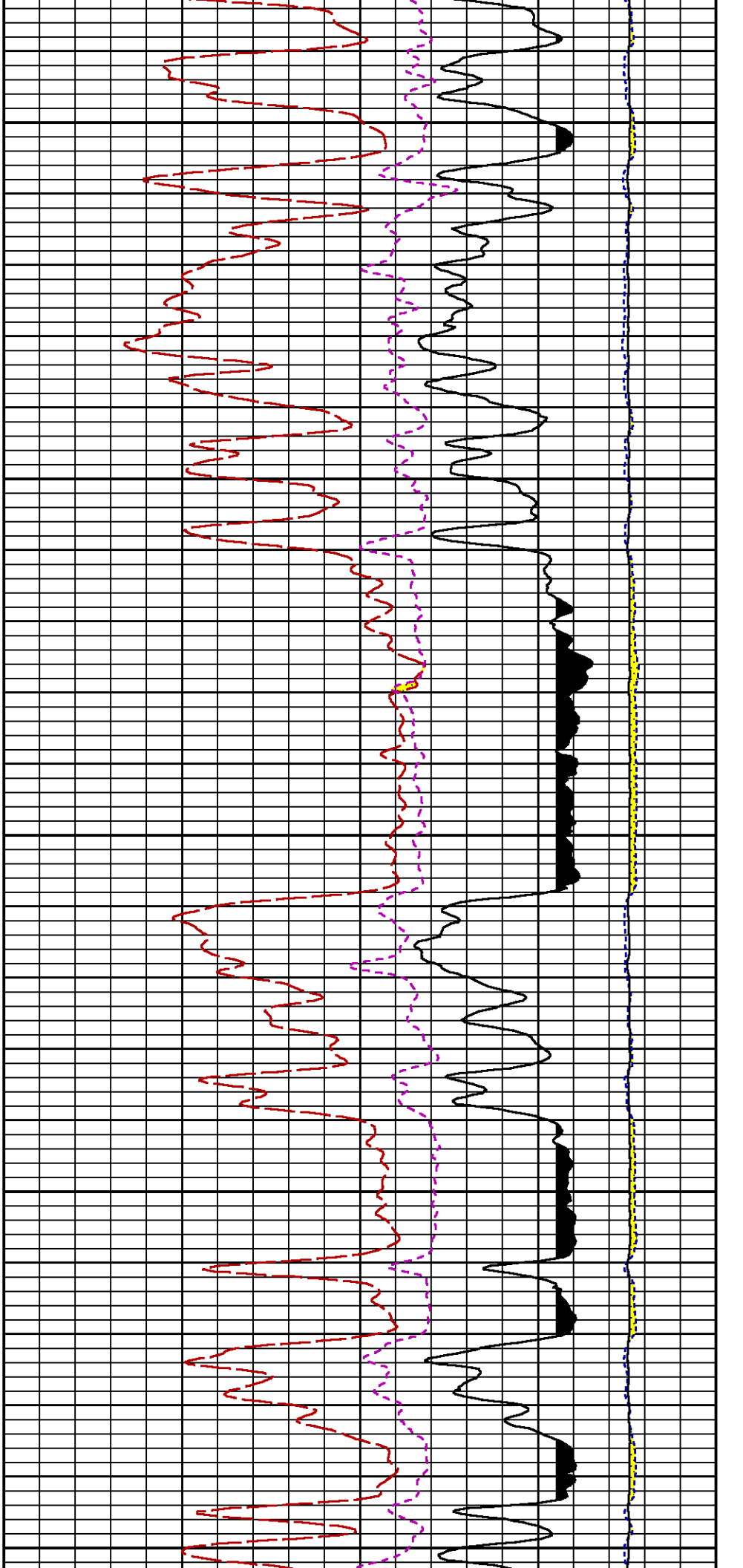


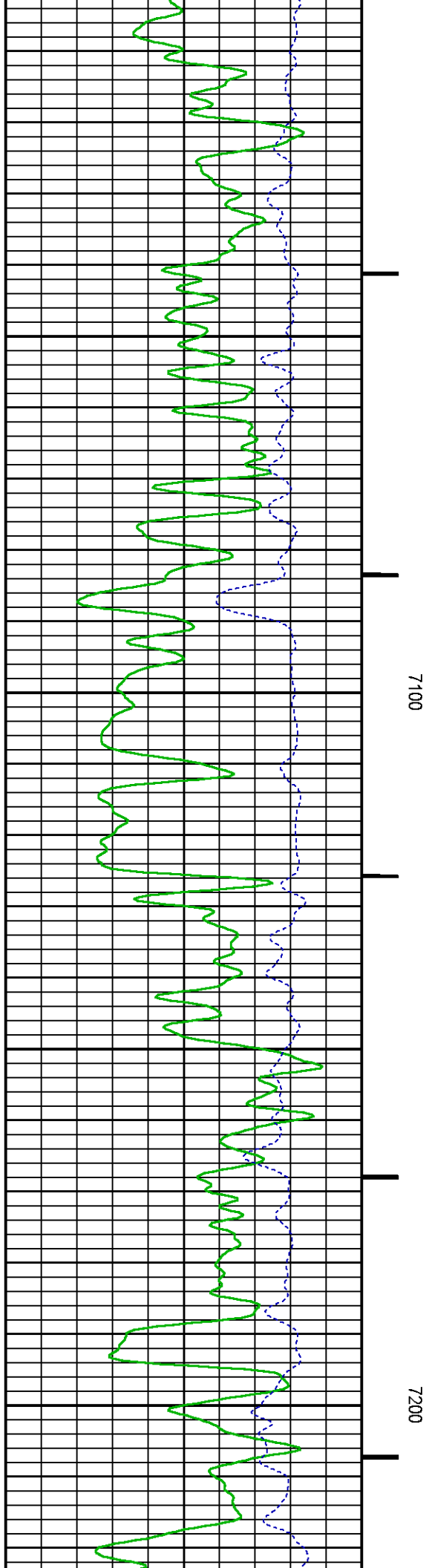
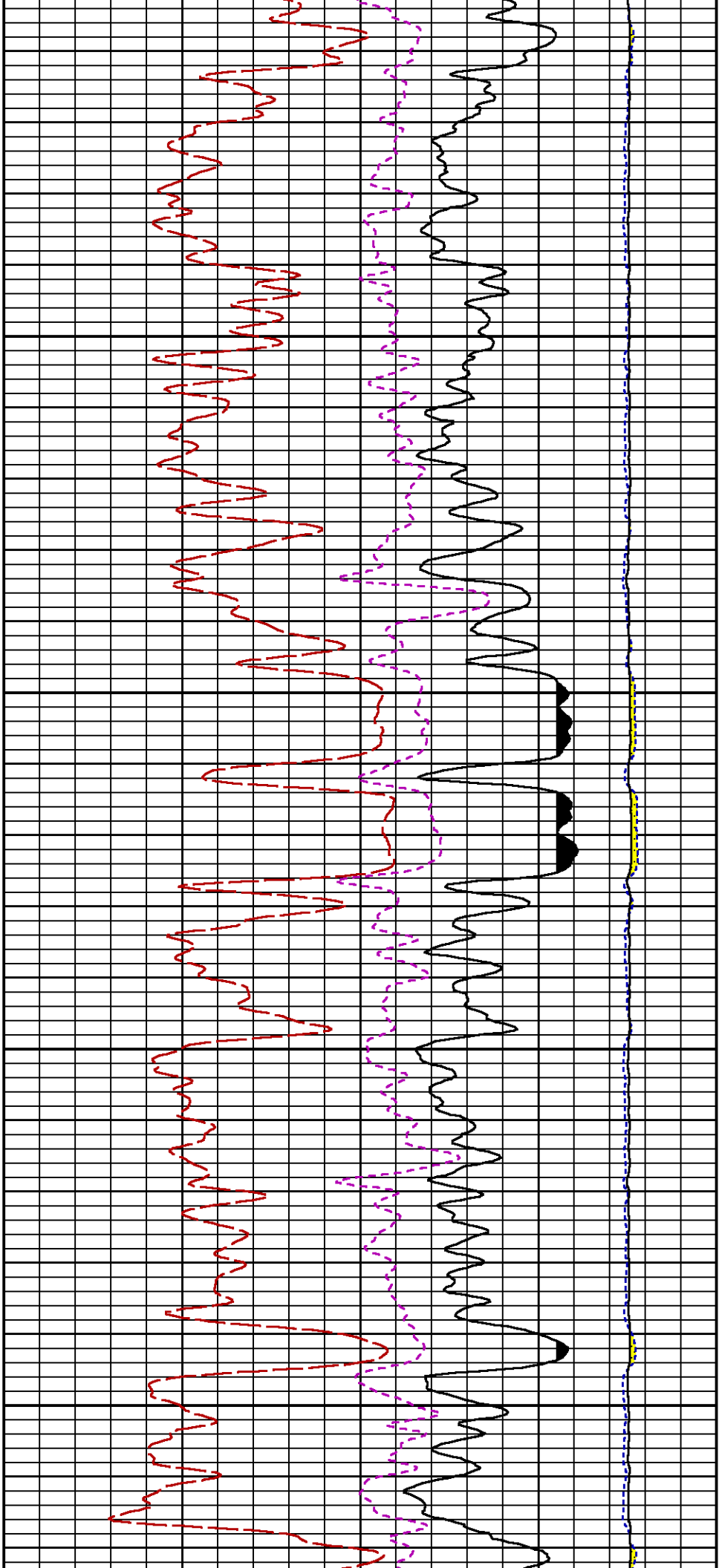


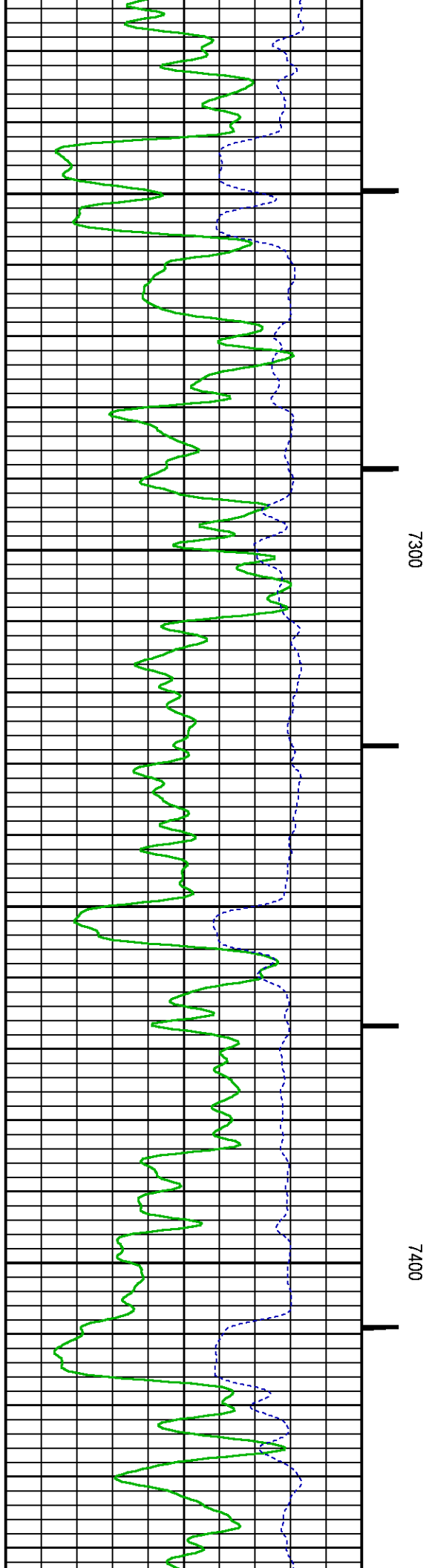
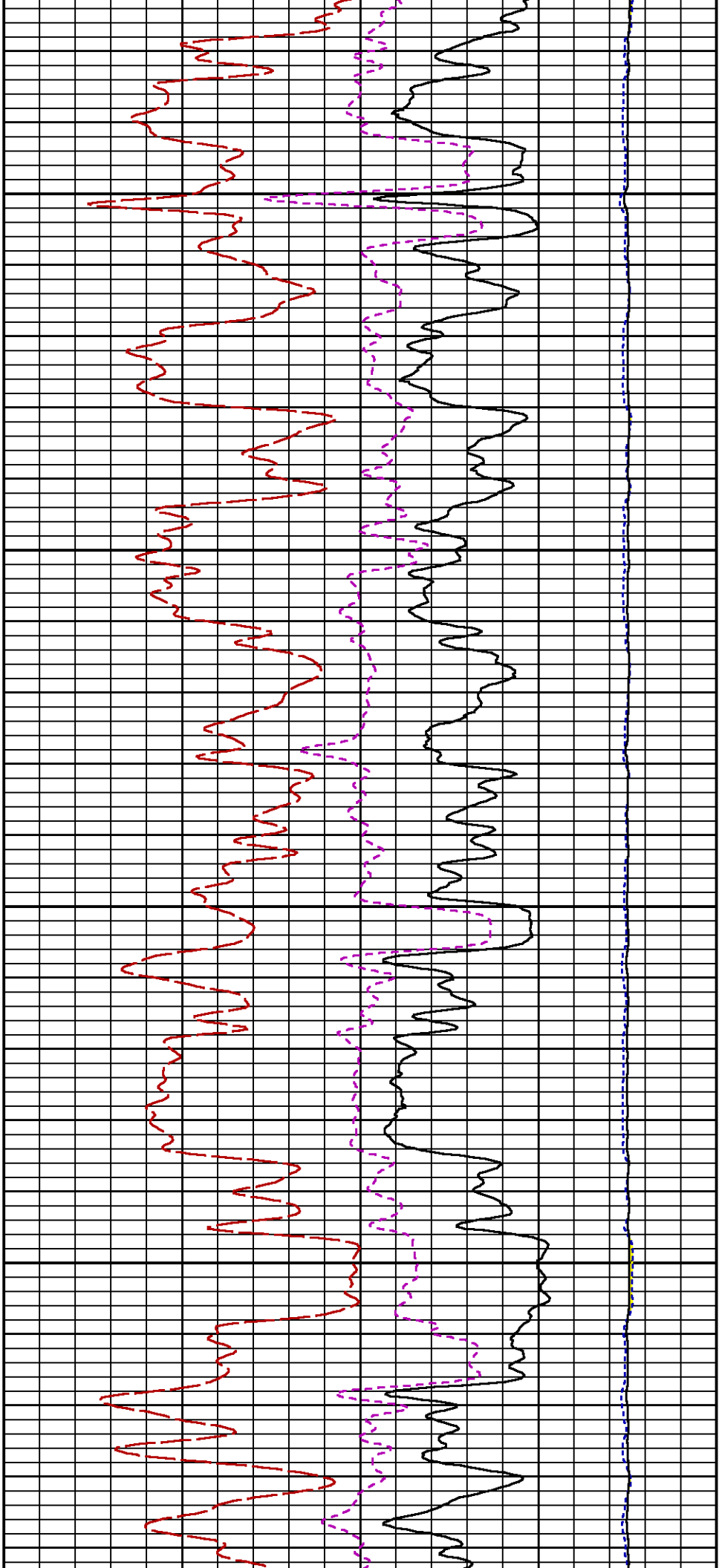


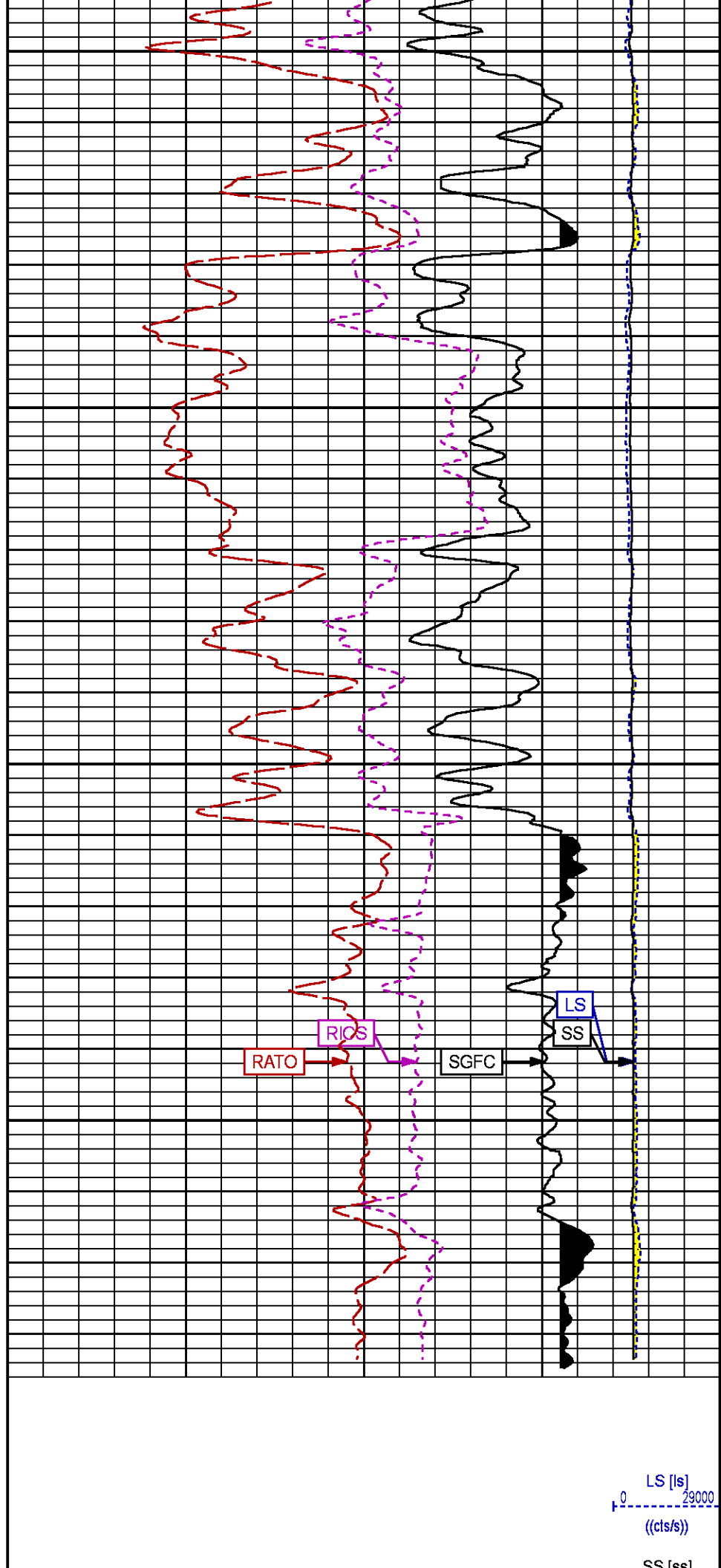
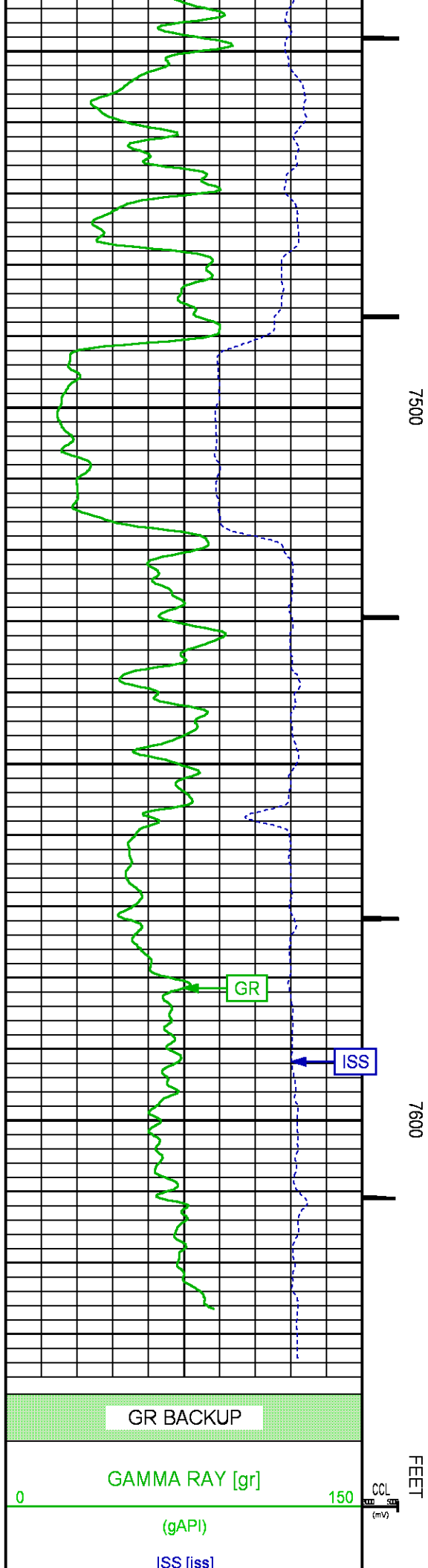














0	1E+06			0	290000
((cts/s))				((cts/s))	
			RATO [rato]		
		17			0
			(dim)		
			RICS [rics]		
		39			9
			(dim)		
			SGFC [sgfc]		
		60			0
			(cu)		

## RPM REPEAT PASS WILLIAMS FORK

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017  
Updates: 1

Plotted: Thu Nov 29 17:04:24 2018

### PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_BCU\_0993\_21\_02W/p353h01.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 4670.647 ft BOTTOM DEPTH: 4999.029 ft

### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
GR	FILTER ( )	medium (1)		TOP	BOTTOM

### RPM PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
PNC Parameters	BOREHOLE CONTENTS	FLUID		TOP	BOTTOM
	OPEN/CASED HOLE	CASED HOLE		"	"
	BOREHOLE SIZE	7.88	in	"	"
	LARGEST CASING OD	4.50	in	"	"
	MATRIX	SANDSTONE		"	"

### CURVE DESCRIPTION REPORT

CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:CCL	Nov 29 12:45:02 2018	CASING COLLAR LOCATOR
F1:GR	Nov 29 12:45:02 2018	GAMMA RAY
F1:ISS	Nov 29 12:45:02 2018	INELASTIC SHORT SPACE COUNT RATE
F1:LS	Nov 29 12:45:02 2018	LONG SPACE COUNT RATE
F1:RATO	Nov 29 12:45:02 2018	SHORT/LONG SPACE COUNT RATE RATIO
F1:RICS	Nov 29 12:45:02 2018	SHORT SPACE INELASTIC TO CAPTURE COUNT RATE RATIO (ISS/CSS)
F1:SGFC	Nov 29 12:45:02 2018	BOREHOLE AND DIFFUSION CORRECTED SIGMA
F1:SS	Nov 29 12:45:02 2018	SHORT SPACE COUNT RATE

### CURVE MEASURE POINT OFFSET

CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
CCL	-26.00	ISS	-12.75	RATO	-12.75	SGFC	-12.75
GR	-23.00	LS	-12.75	RICS	-12.75	SS	-12.75

Presentation

Plot Interval

: SysA:/dat1a/LARAMIE\_BCU\_0993\_21\_02W/02W\_RPM\_WF\_REPEAT.fvpdf [5"/100' Scale]

: 4648.5 - 4999.25 Feet

Data File 1

Created On

Company

Well

Field

File Interval

OCT

: F1 : SysA:/dat1a/LARAMIE\_BCU\_0993\_21\_02W/RPM\_WF\_REPEAT.xtf

: Nov 29 12:45:02 2018

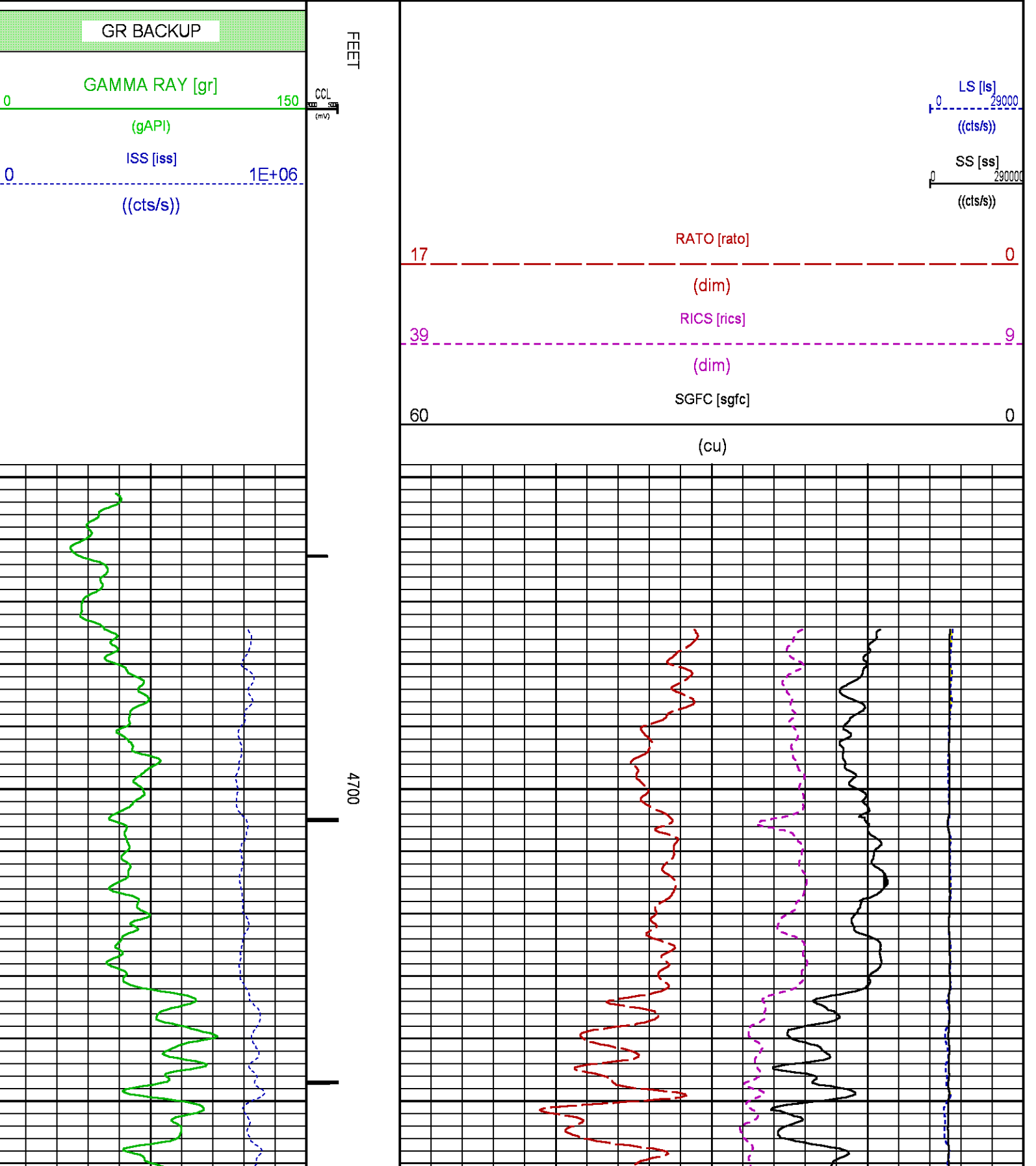
: LARAMIE ENERGY LLC

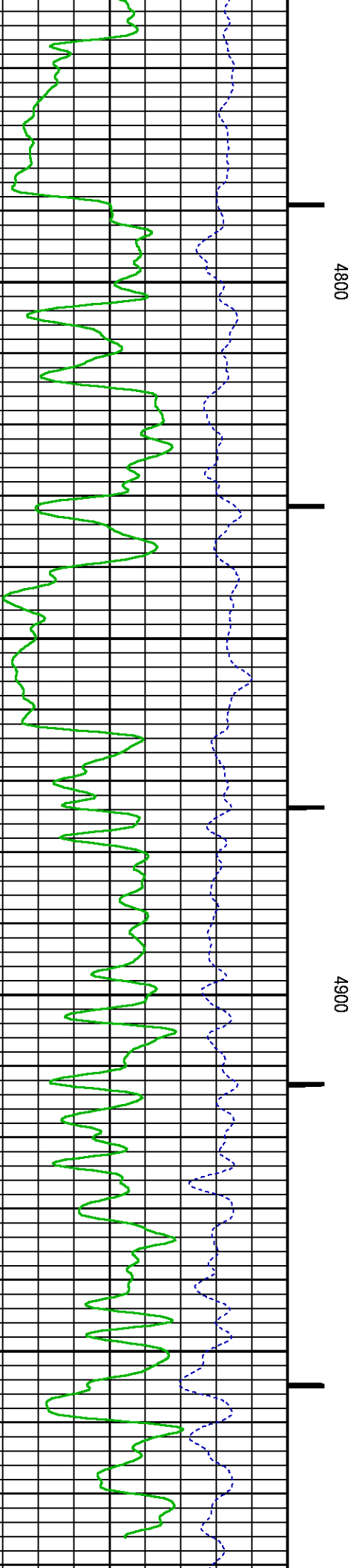
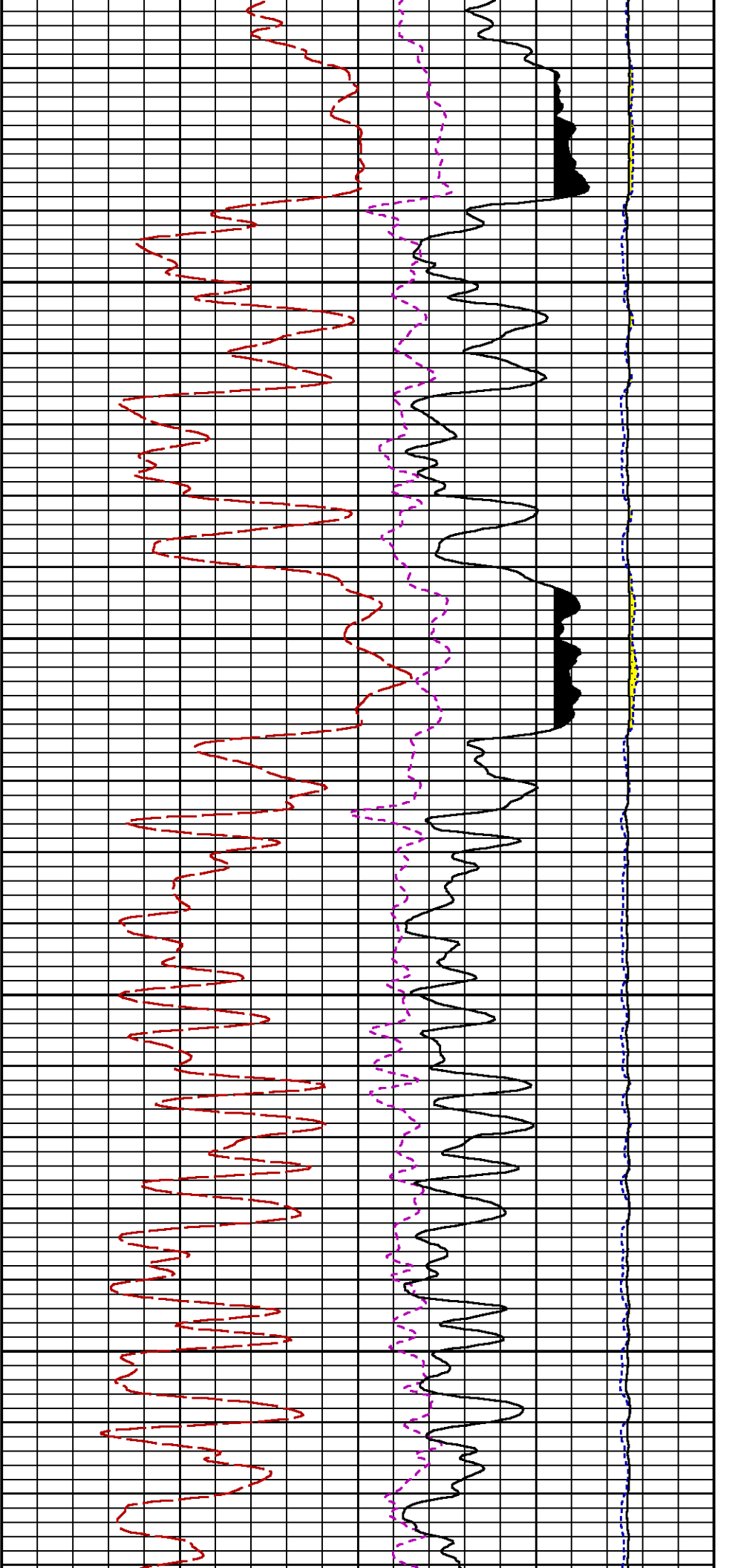
: BCU 0993-21-02W

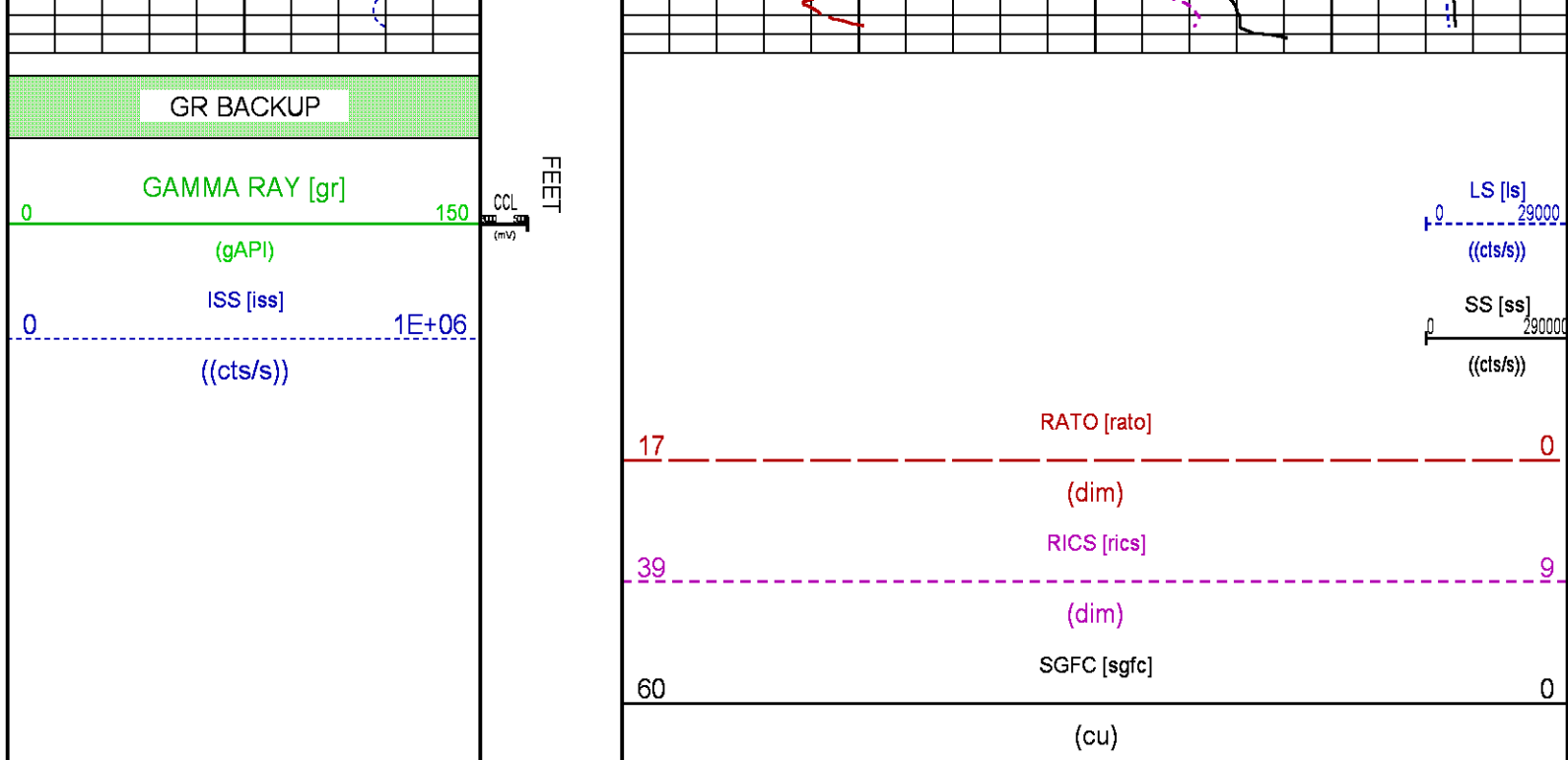
: BUZZARD CREEK

: 4647.75 - 4999.5 Feet

: p353h







## CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/LARAMIE\_BCU\_0993\_21\_02W/p353h.tp1

### GR PRIMARY CALIBRATION SUMMARY

TOOL #: 8262XA 10456406

DATE/TIME PERFORMED: Fri Sep 14 11:40:12 2018

UNIT #: 5753XD 10412898

CALB JIG #: 4702NK BA-869

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	CR DIFF (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	CALBRTR (gAPI)
GR	159.02	499.09	340.1	0.529	84.17	264.17	180

### GR PRIMARY VERIFICATION SUMMARY

TOOL #: 8262XA 10456406

DATE/TIME PERFORMED: Fri Sep 14 11:42:18 2018

UNIT #: 5753XD 10412898

VERI JIG #: 4702NK BA-869

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	159.53	501.09	0.529	84.44	265.23	180.79
						170.00 190.00

## GR BEFORE LOG VERIFICATION SUMMARY

NOT DONE

## GR AFTER LOG VERIFICATION SUMMARY

NOT DONE

## RPM\_PNC\_3D PRIMARY CALIBRATION SUMMARY

TOOL: 8283PA 11768879

DATE/TIME PERFORMED: Thu Nov 8 21:54:03 2018

UNIT: 5753XD 10412898

CALIBRATOR: 2437XB 112674

SOURCE: 8281AA 10220690

HOURS: 8281AA 70

	ISS	Mtr Vlt (V)	SS Gain	LS Gain	XLS Gain	EA Temp (degF)	Sync Delay (usec)	RCAL
Raw Data	803537	124	2236	2175	2182	101	9.5	0.9686

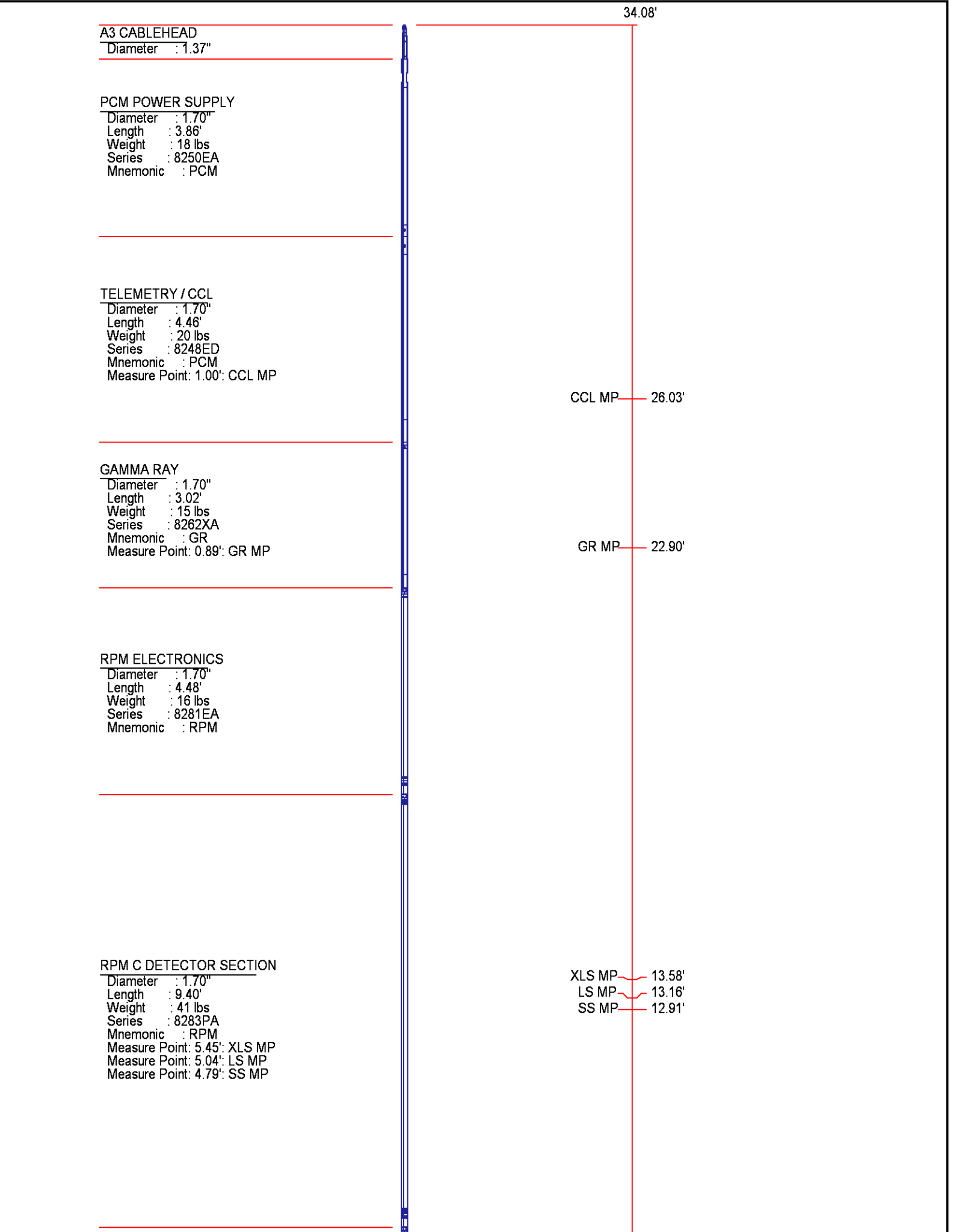
Interpolated	1300000	148	2212	2169	2178
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	ISS	BKS	BKL	BKX	SGA1	SDA1	SGA2	SDA2
Raw Data	803537	8701	4296	466	26.15	0.15	24.17	0.37
					25.35 26.40	0.00 0.20	23.60 24.80	0.00 0.40

	ISS	ILS	IXS	SS	SS2	LS	CSS	CLS
Raw Data	803537	173305	26482	92381	32838	8458	55917	13580
Fit Quality %		1.076	1.409	1.049	1.083	1.132	0.965	1.149

	ISS	RBOR	RIN ISS/ILS	RIN13 ISS/IXS	RICS ISS/CSS	RATO SS/LS	RTWO SS2/LS	RONE CSS/CLS
Raw Data	803537	1.43	4.64	30.36	14.37	10.93	3.89	4.12
		1.42 1.45	3.55 5.52	22.20 32.70	10.99 16.34	10.06 11.10	3.57 3.95	3.76 4.22
Fit Quality %		0.064	0.219	0.122	0.239	0.042	0.028	0.045
Reduced	1390124	1.43	4.64	30.35	14.37	10.94	3.89	4.12
		1.42 1.45	4.33 5.52	27.60 32.70	13.70 16.34	10.06 11.10	3.57 3.95	3.76 4.22

INSTRUMENT CONFIGURATION



## RPM SOURCE SECTION

Diameter : 1.70"  
 Length : 4.70'  
 Weight : 18 lbs  
 Series : 8281FA  
 Mnemonic : RPM

## TEMPERATURE / PRESSURE

Diameter : 1.70"  
 Length : 3.30'  
 Weight : 13 lbs  
 Series : 8255XA  
 Mnemonic : SRPL  
 Measure Point: 1.52': TEMP MP

TEMP MP  
 PRES MP

1.65'

## BULL PLUG 1 11/16

0.00'

TOTAL LENGTH: 34.08'  
 TOTAL WEIGHT: 144 lbs  
 MAX DIAMETER: 0'1.70"

**BAKER  
HUGHES**  
a GE company



**ECLIPS**

COMPANY LARAMIE ENERGY LLCWELL BCU 0993-21-02WFIELD BUZZARD CREEKCOUNTY MESASTATE COLORADO

FILE NO:

CH145369

API NO:

05077105230000

LOCATION:

SHL: 381.0' FNL &amp; 1321.0' FWL

ELEVATIONS:

KB 7287.0 FT

DF

GL 7257.0 FT

SEC 21.0 TWP 9.0 S RGE 93.0 WDATE 29-NOV-2018