Schlumberger

Company: **QUICKSILVER RESOURCES INC.**

Well: **PIRTLAW PARTNERS LTD 24−33**

Field: **WILDCAT**

County: **ROUTT** State: **COLORADO**

CEMENT BOND LOG
GAMMA RAY
TEMPERATURE/CCL

LOCATION

645’ FSL & 1963’ FWL

Elev.: K.B. 6976.00 ft
G.L. 6960.00 ft
D.F. 6976.00 ft

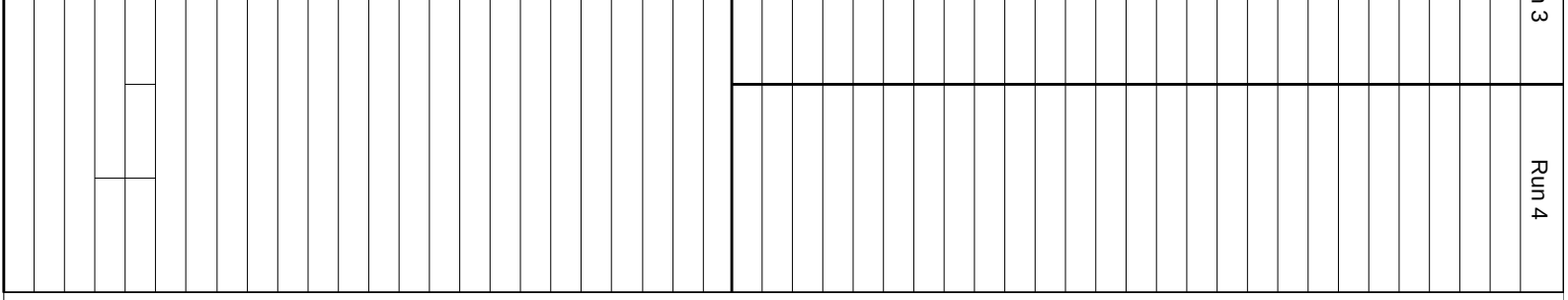
Permanent Datum: GROUND LEVEL Elev.: 6960.00 ft
Log Measured From: KELLY BUSHING 16.00 ft above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No.	Section	Township	Range
05107062480000	33	7N	87W

County: ROUTT
Field: WILDCAT
Location: 645’ FSL & 1963’ FWL
Well: PIRTLAW PARTNERS LTD 24−33
Company: QUICKSILVER RESOURCES IN

Logging Date	3−Oct−2012		
Run Number	1		
Depth Driller	7880 ft		
Schlumberger Depth	7791 ft		
Bottom Log Interval	7782 ft		
Top Log Interval	3800 ft		
Casing Fluid Type	WATER		
Salinity			
Density	8.3 lbm/gal		
Fluid Level	16 ft		
BIT/CASING/TUBING STRING			
Bit Size	6.125 in		
From	16 ft		
To	7880 ft		
Casing/Tubing Size	4.500 in		
Weight	13.5 lbm/ft		
Grade			
From	16 ft		
To	7880 ft		
Maximum Recorded Temperatures	210 degF		
Logger On Bottom / Time	3−Oct−2012	10:00	
Unit Number / Location	410	VERNAL, UT	
Recorded By	TONY PAYNE		
Witnessed By	CARL BOWERS		

		Run 1	Run 2	Run
PVT DATA	Oil Density			
	Water Salinity			
	Gas Gravity			
	Bo			
	Bw			
	1/Bg			
	Bubble Point Pressure			
	Bubble Point Temperature			
	Solution GOR			
	Maximum Deviation			
	CEMENTING DATA			
	Primary/Squeeze	Primary		
	Casing String No			
	Lead Cement Type			
	Volume			
	Density			
	Water Loss			
	Additives			
	Tail Cement Type			
	Volume			
	Density			
	Water Loss			
	Additives			
	Expected Cement Top			
	Logging Date			
	Run Number			
	Depth Driller			
	Schlumberger Depth			
	Bottom Log Interval			
	Top Log Interval			
	Casing Fluid Type			
	Salinity			
	Density			
	Fluid Level			
	BIT/CASING/TUBING STRING			
	Bit Size			
	From			
	To			
	Casing/Tubing Size			
	Weight			
	Grade			
	From			
	To			
	Maximum Recorded Temperatures			
	Logger On Bottom / Time			
	Unit Number / Location			
	Recorded By			
	Witnessed By			



DEPTH SUMMARY LISTING

Date Created: 3−OCT−2012 13:39:03

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−B	Type:	CMTD−C	Type:	1−25ZT
Serial Number:	600807	Serial Number:	5003	Serial Number:	108447
Calibration Date:	28−SEP−2012	Calibration Date:	03−AUG−201	Length:	18430 FT
Calibrator Serial Number:	33	Calibrator Serial Number:	100518		
Calibration Cable Type:	1−25ZT	Number of Calibration Points:	10	Conveyance Method:	Wireline
Wheel Correction 1:	−3	Calibration RMS:	8	Rig Type:	LAND
Wheel Correction 2:	−2	Calibration Peak Error:	13		

Depth Control Parameters

Log Sequence: Subsequent Log In the Well

Reference Log Name: PLATFORM EXPRESS
Reference Log Run Number: 1
Reference Log Date: 20−AUG−2012

Depth Control Remarks

1. IDW USED AS PRIMARY DEPTH CONTROL
2. DRUM COUNTER USED AS SECONDARY
3. Z−CHART USED AS THIRD
4.
5.
6.

OTHER SERVICES1	OTHER SERVICES2
OS1:	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
THIS LOG WAS CORRELATED TO SCHLUMBERGER PLATFORM	
EXPRESS LOG DATED 20−AUG−2012	
TOTAL DEPTH: 7791 FT.	
SHORT JOINT: 5962−5984 FT.	
EST. TOP OF CEMENT: 4854 FT. (GOOD BOND)	

MAX. PRESSURE: 3386 PSI.	
MAX. TEMPERATURE: 210 DEGF	
EXP. FREE PIPE AMP. IS 81 MV	
CBAF SET TO .84	
CREW: D. FLINT	
THANK YOU FOR CHOOSING E&P WIRELINE, A SCHLUMBERGER COMPANY	

RUN 1			RUN 2		
SERVICE ORDER #:		BX7S−00071	SERVICE ORDER #:		
PROGRAM VERSION:		18C0−147	PROGRAM VERSION:		
FLUID LEVEL:		16 ft	FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

RUN 1 | RUN 2

SURFACE EQUIPMENT

WITM−A
PSC_16MHZ

DOWNHOLE EQUIPMENT

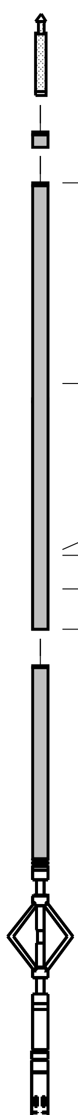
MH−22 30.3
MH−22

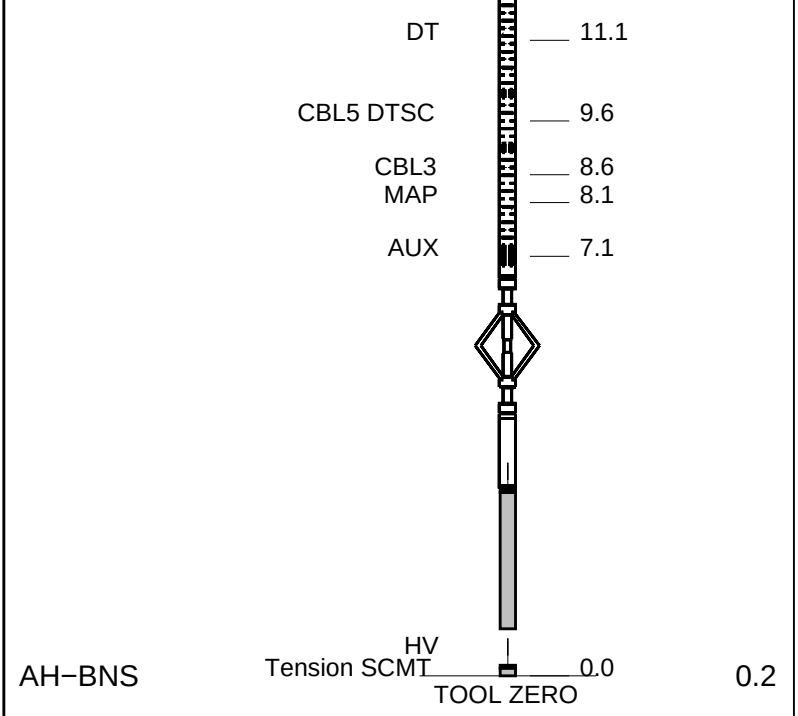
AH−38 28.8
Detail MT
TelStatus
CTEM — 28.5

PSPT 28.5
PSC−A
PSPT−A 1810
PSTC−A
PBMS−A
10k_Sapphire_Mano
RTD_Thermometer
GR
CCL
PBMS

GR — 24.8
Well_Temp — 21.7
Manometer — 21.6
CCL — 21.0
PBMS PSTC — 20.2

SCMT−CA 20.2
SCMC−CA
SECH−CA 8079
SCME−K
SCMS−CA 8140
SCMX−CA





AH−BNS

0.2

MAXIMUM STRING DIAMETER 1.69 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Schlumberger

MAIN PASS

MAXIS Field Log

Company: QUICKSILVER RESOURCES INC. **Well: PIRTLAW PARTNERS LTD 24−33**

Output DLIS Files

DEFAULT **SCMT_PSP_005LUP** **FN:4** **PRODUCER** **03−Oct−2012 11:31**

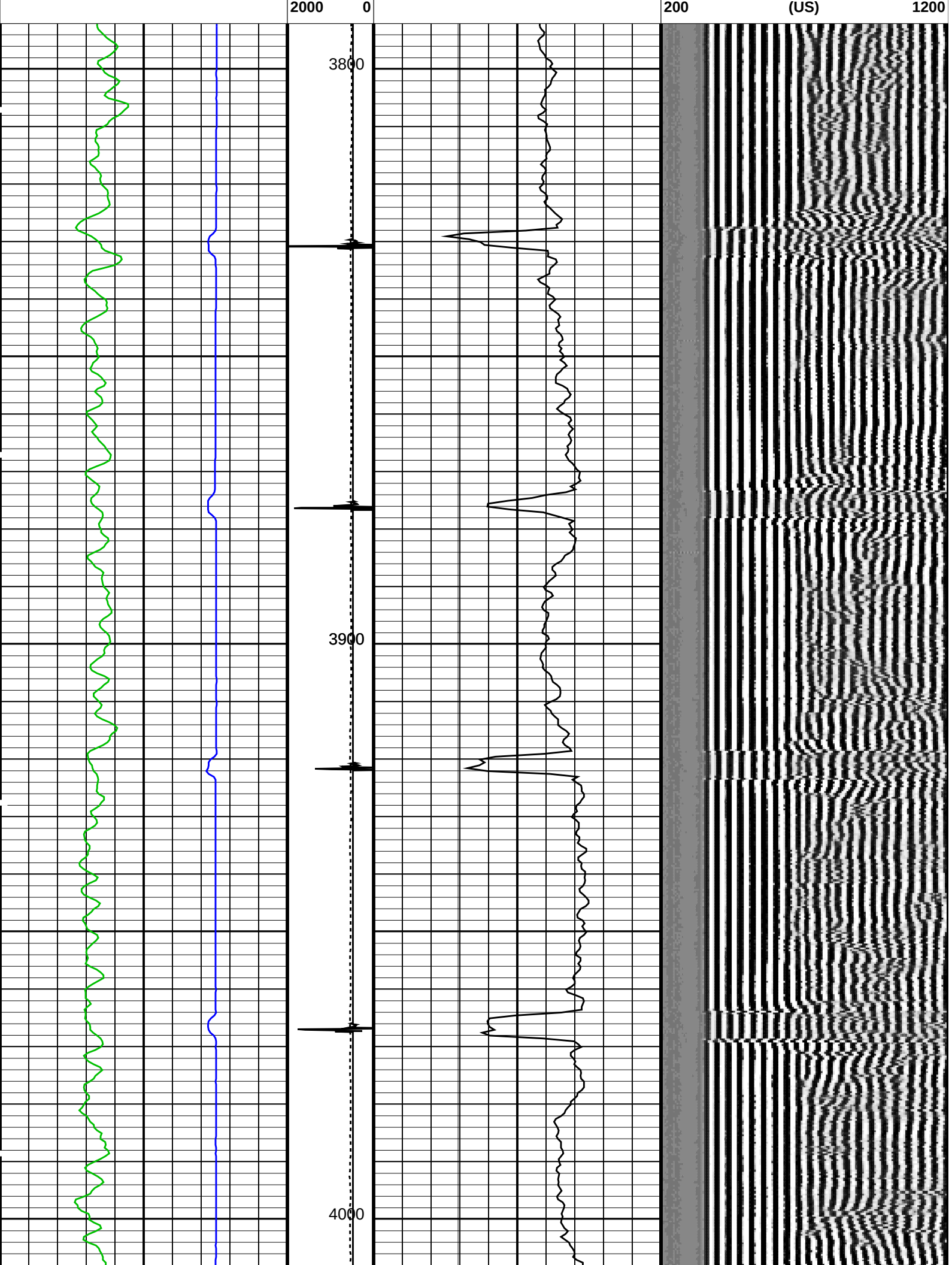
OP System Version: 18C0−147

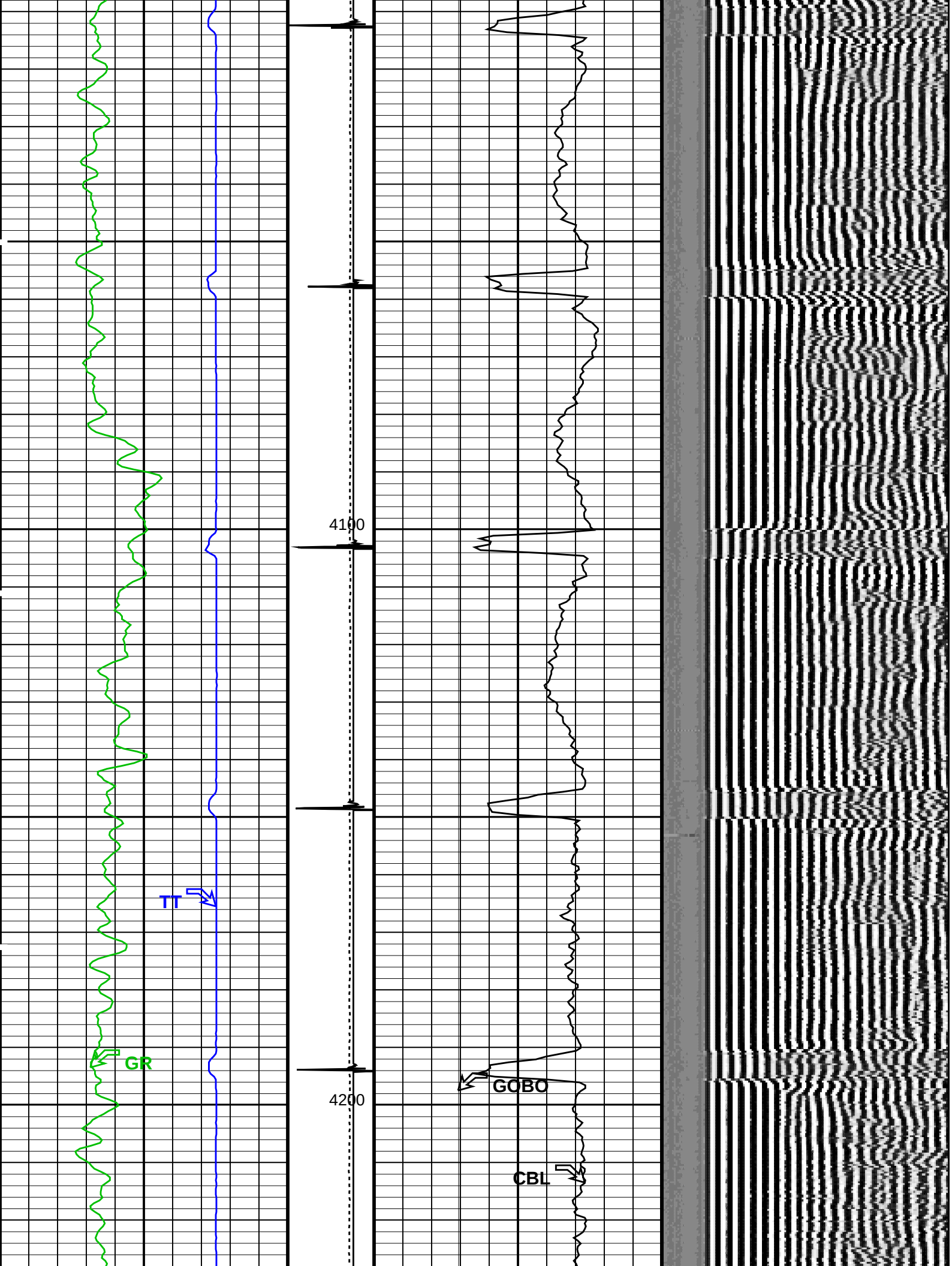
SCMT−CA **18C0−147** **PSPT** **18C0−147**

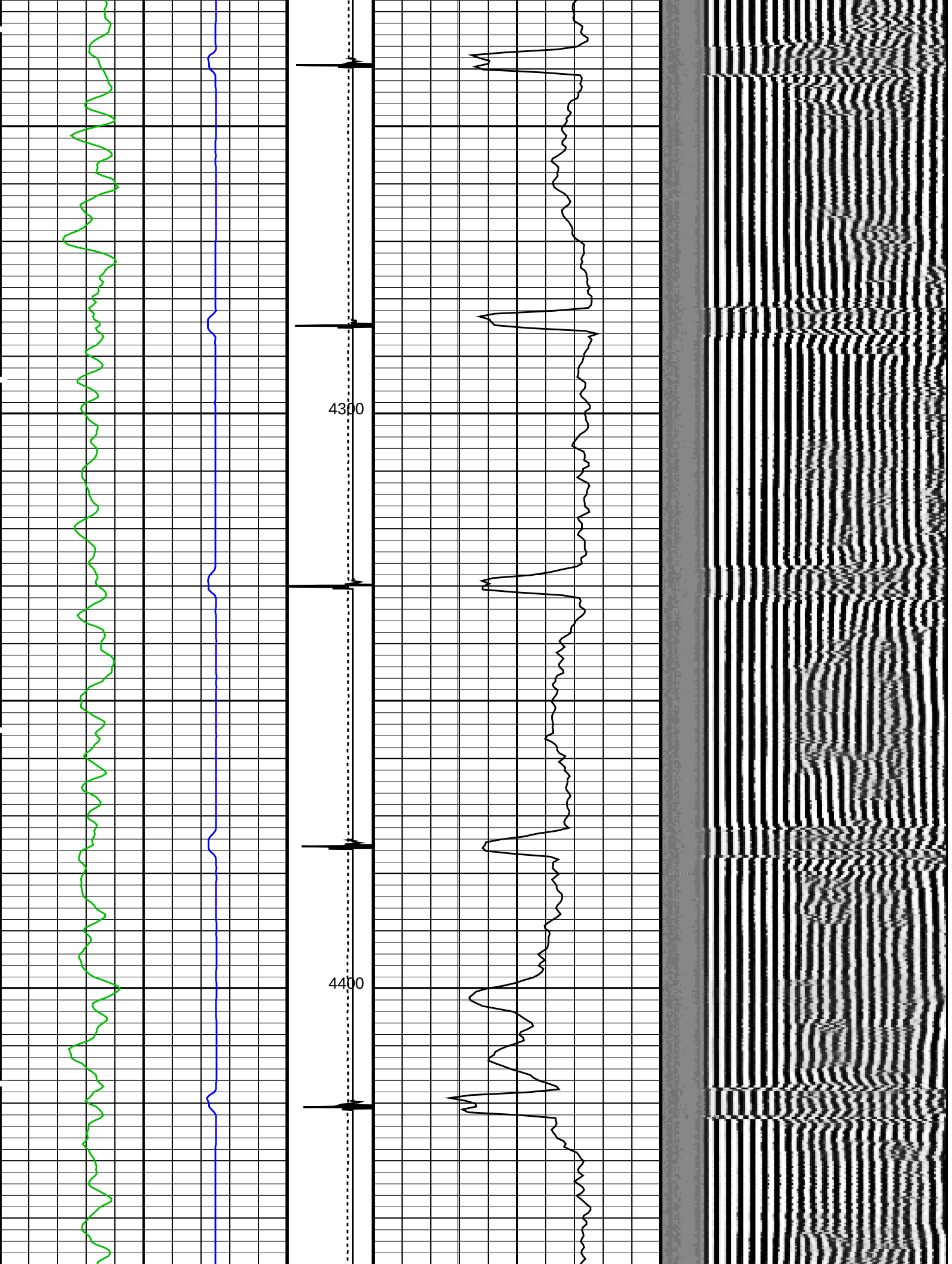
PIP SUMMARY

Time Mark Every 60 S

		GoodBond From ACBL to GOBO Good Bond (GOBO) 0 (MV) 10	
Transit Time (TT) 400 (US) 200	Discriminated CCL (CCLD) 3 (V) −1	CBL Amplitude (CBL) 0 (MV) 100	
Gamma Ray (GR) 0 (GAPI) 150	Tension (TENS) (LBF)	CBL Amplitude (CBL) 0 (MV) 10	Min Amplitude Max VDL VariableDensity (VDL)


2000
0
200
(US)
1200
3800
3900
4000


4100
TT
GR
4200
GOBO
CBL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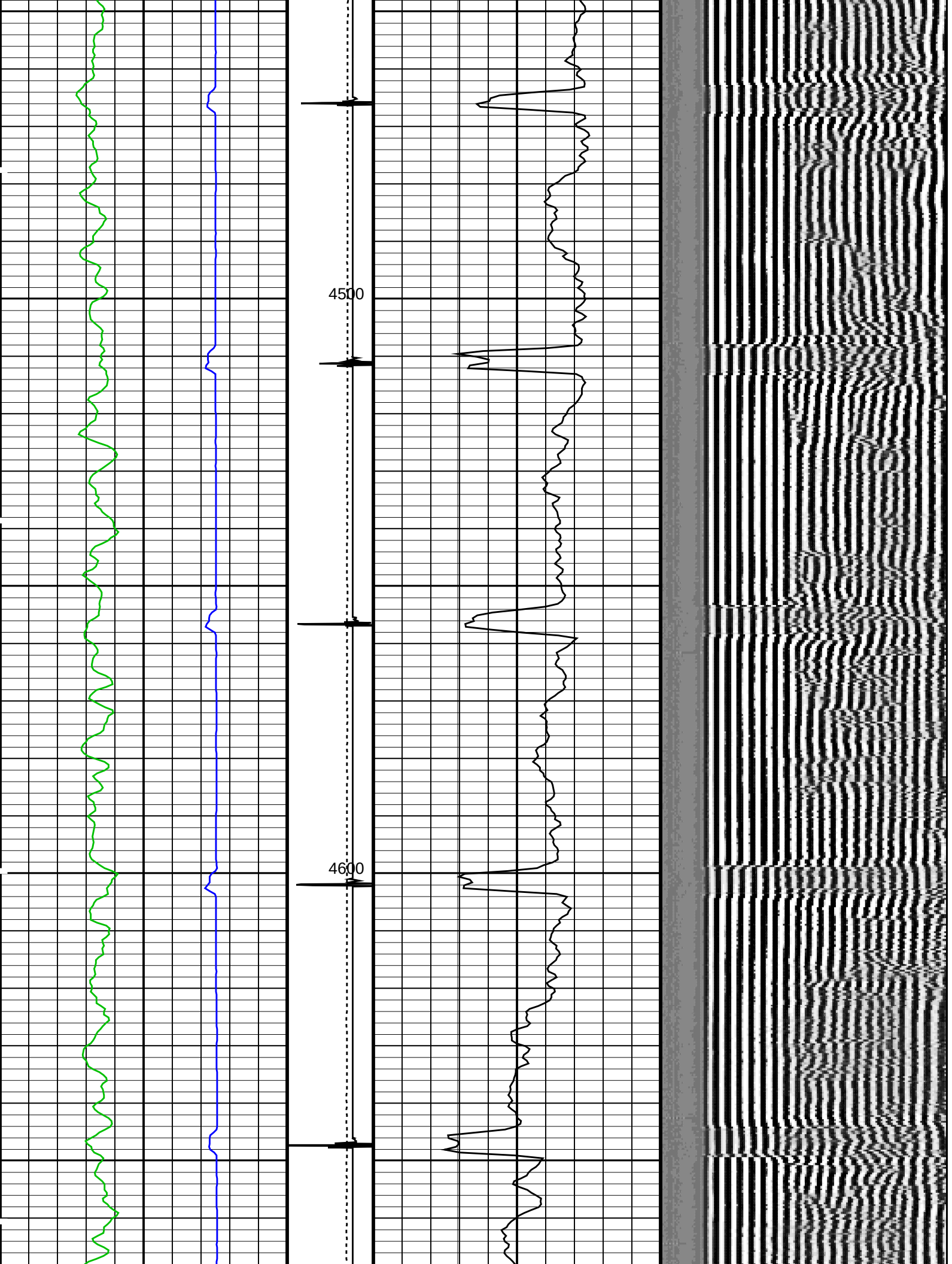
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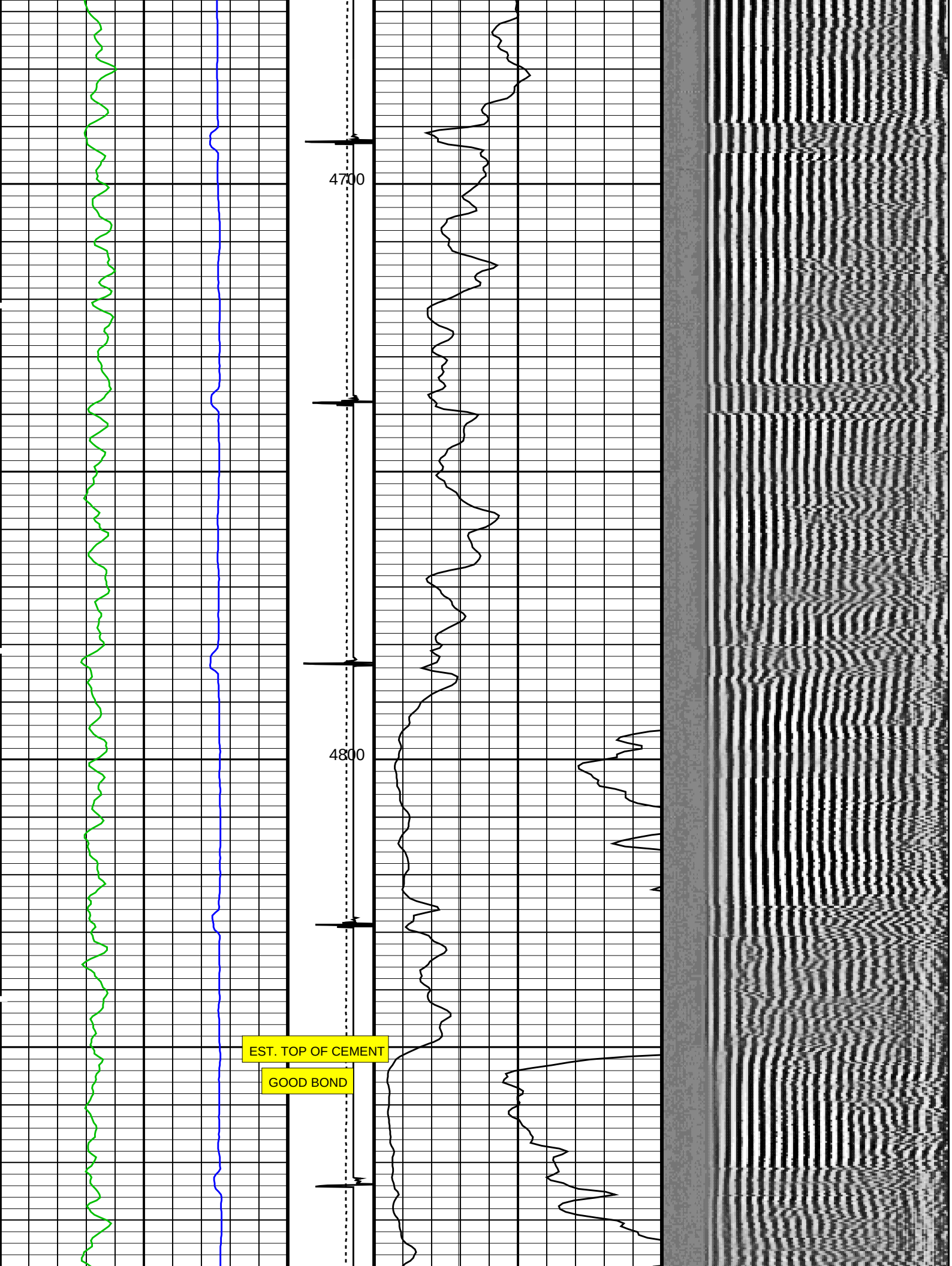
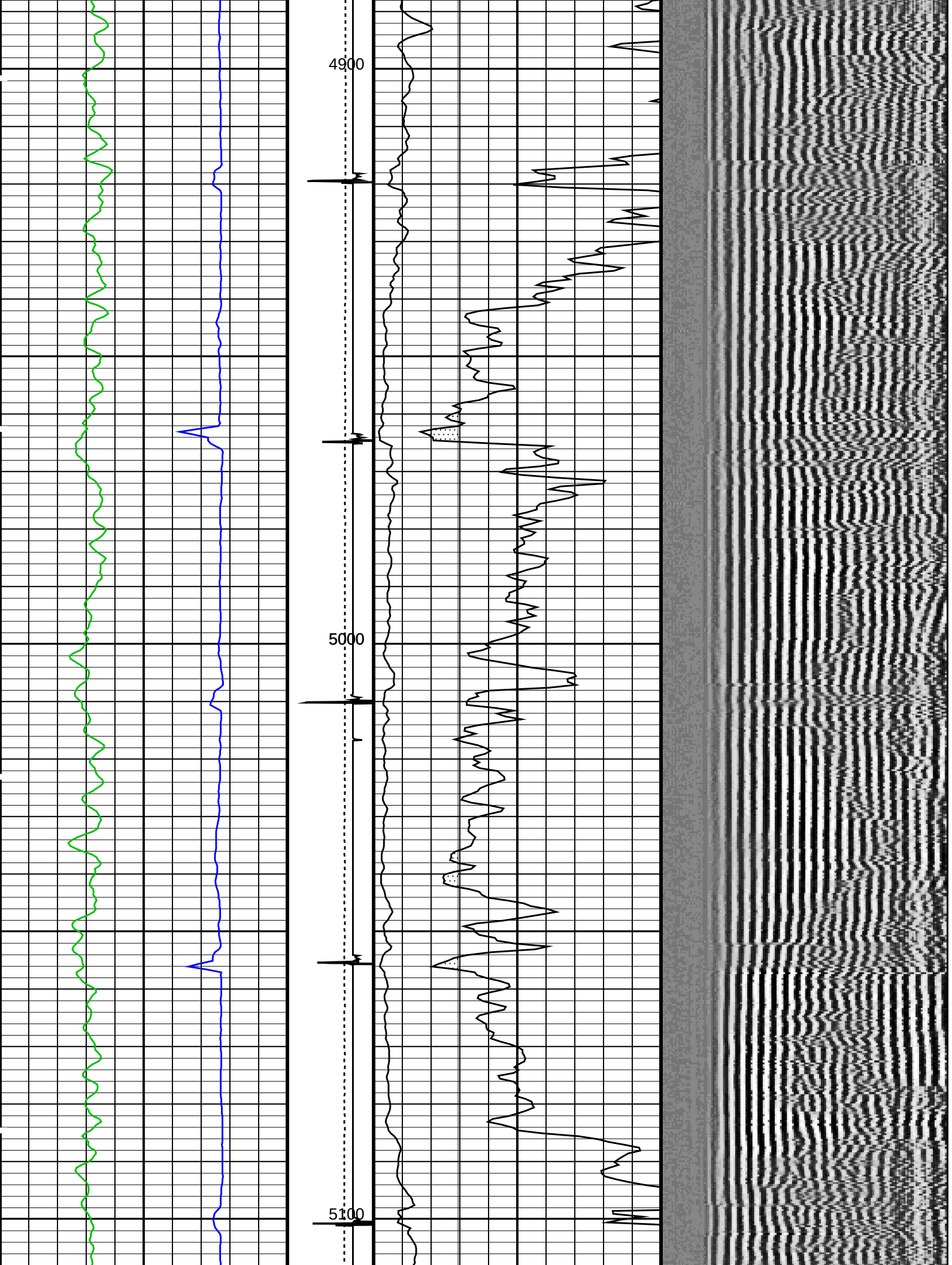

4700
4800
EST. TOP OF CEMENT
GOOD BOND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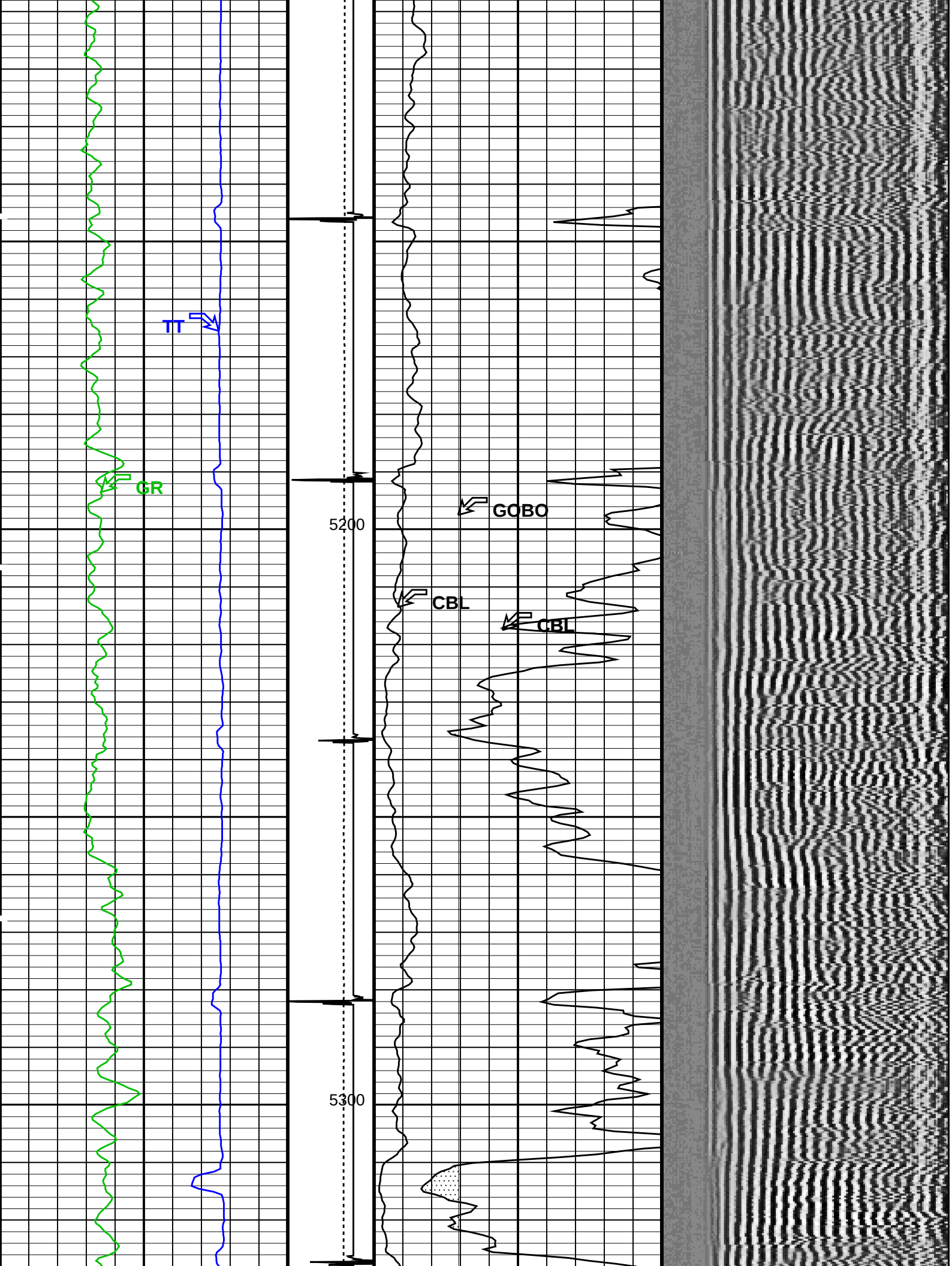
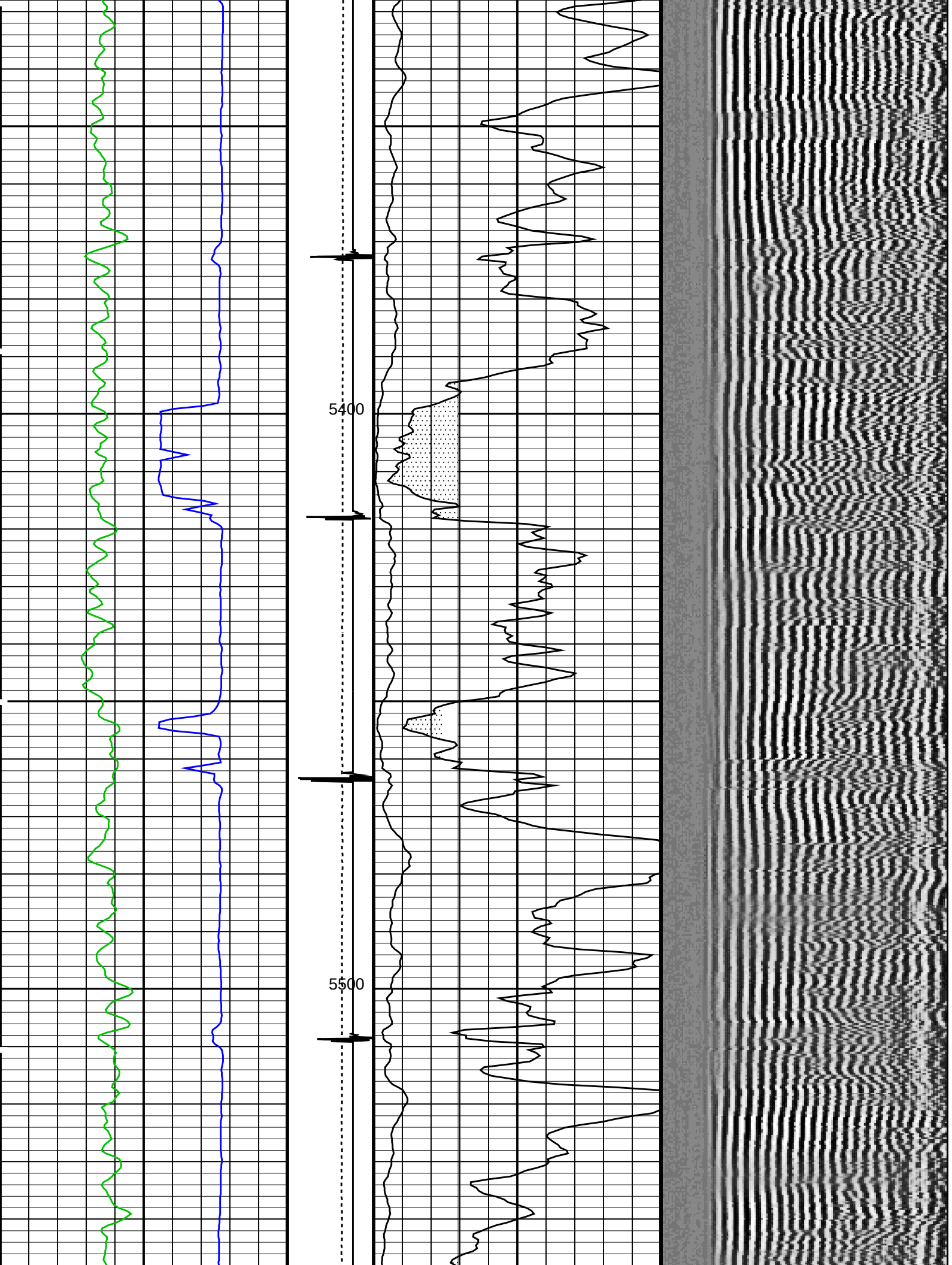
5000
5100


TT
GR
GOBO
5200
CBL
CBL
5300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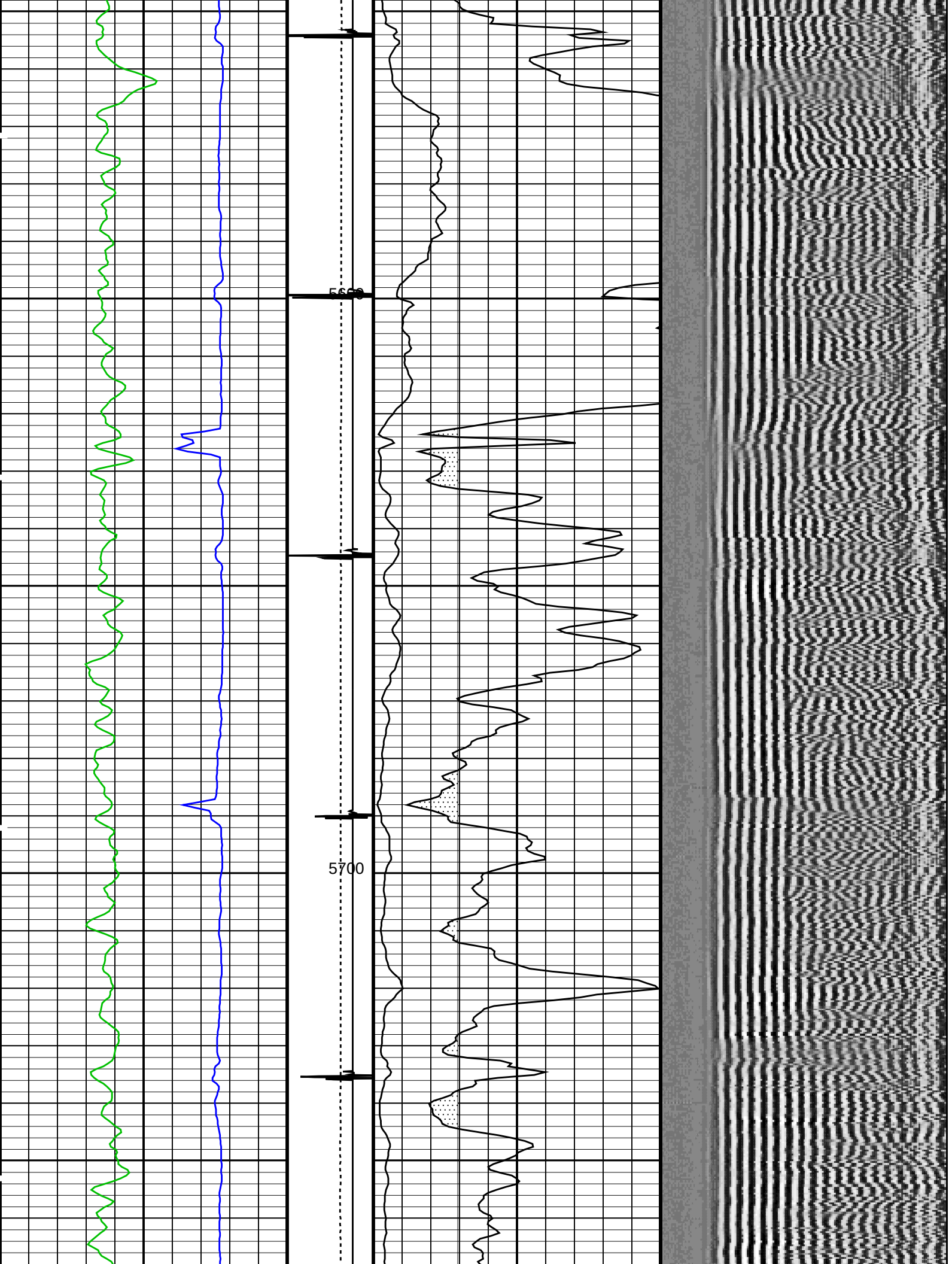
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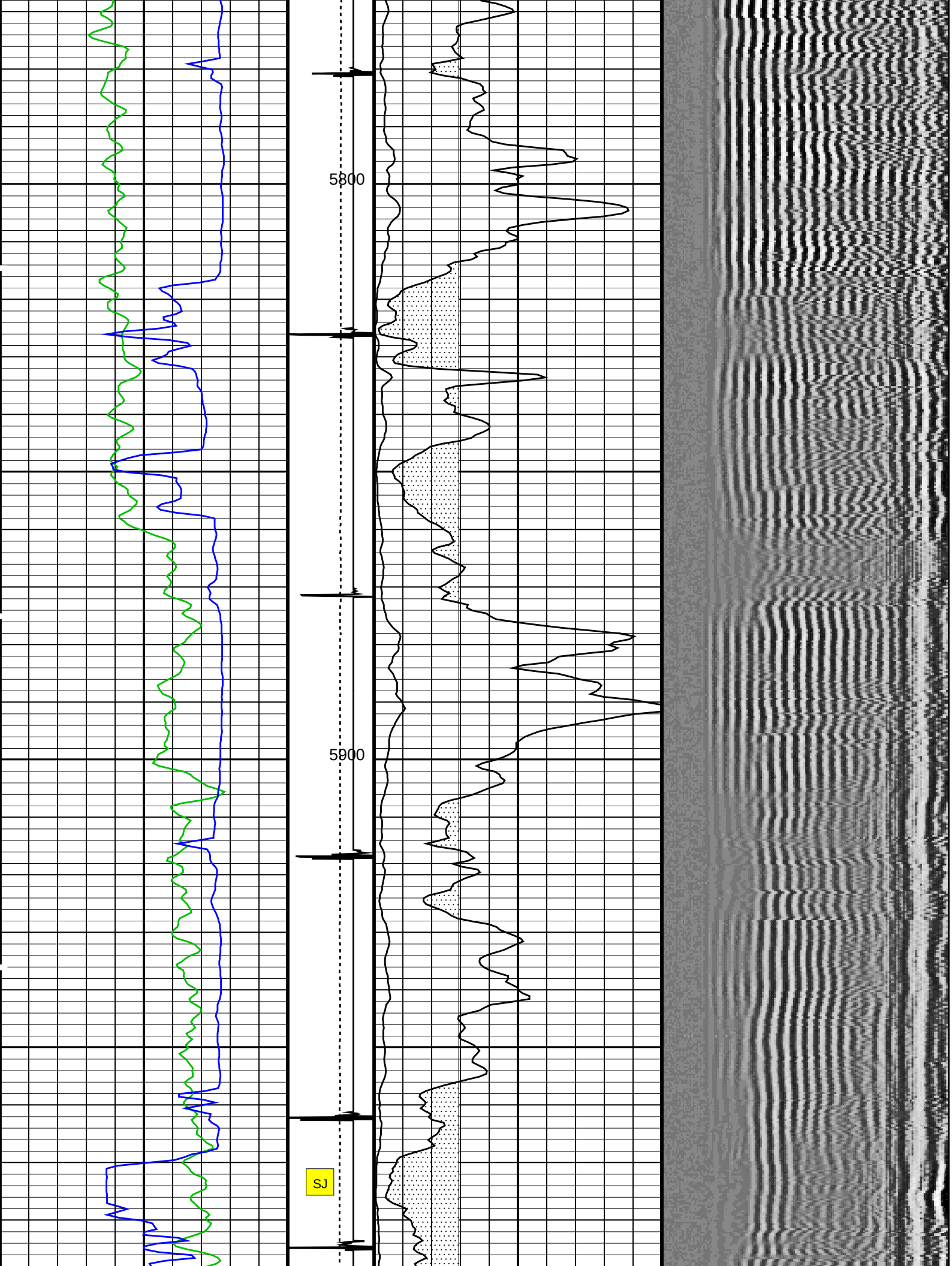
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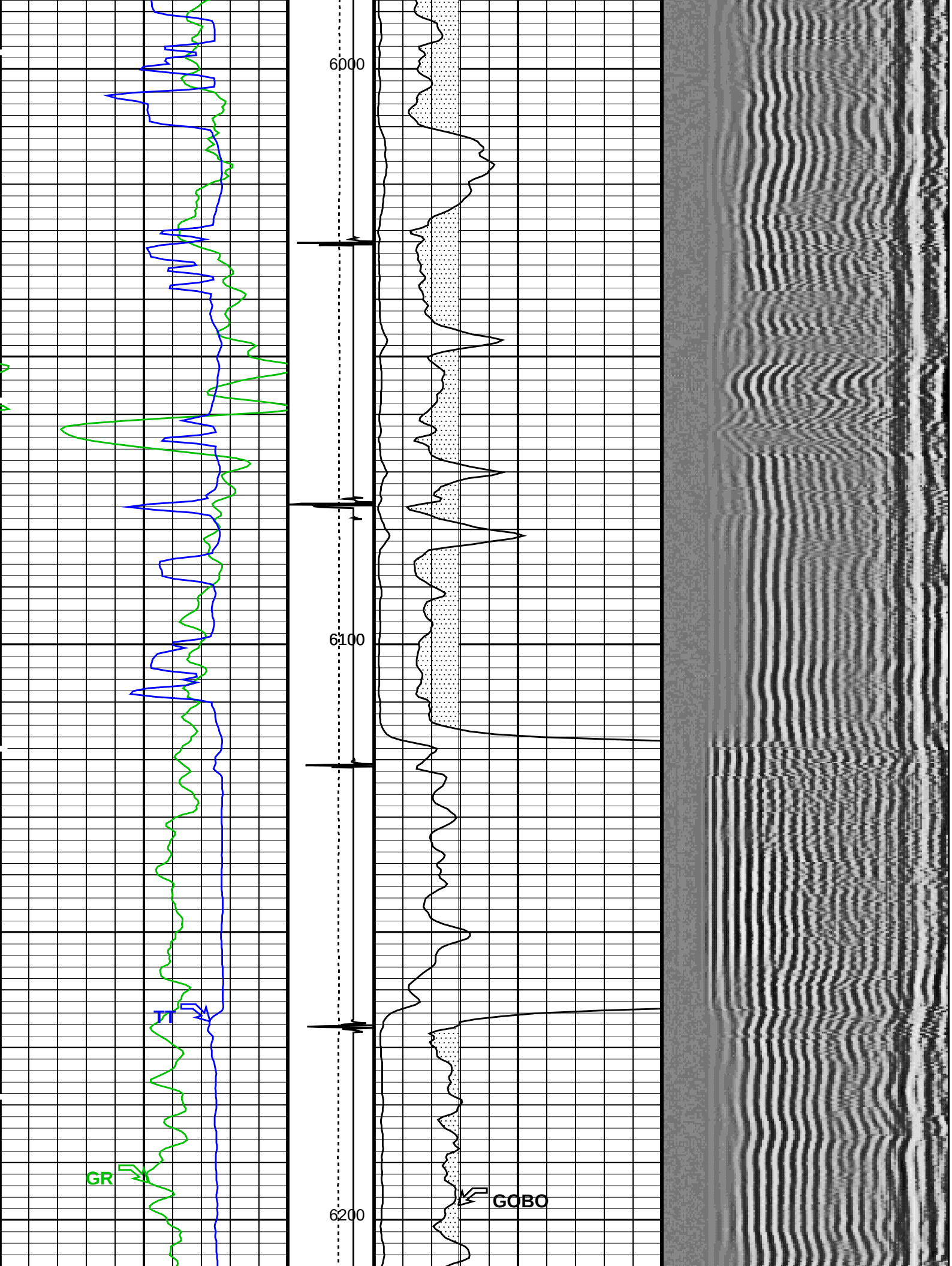
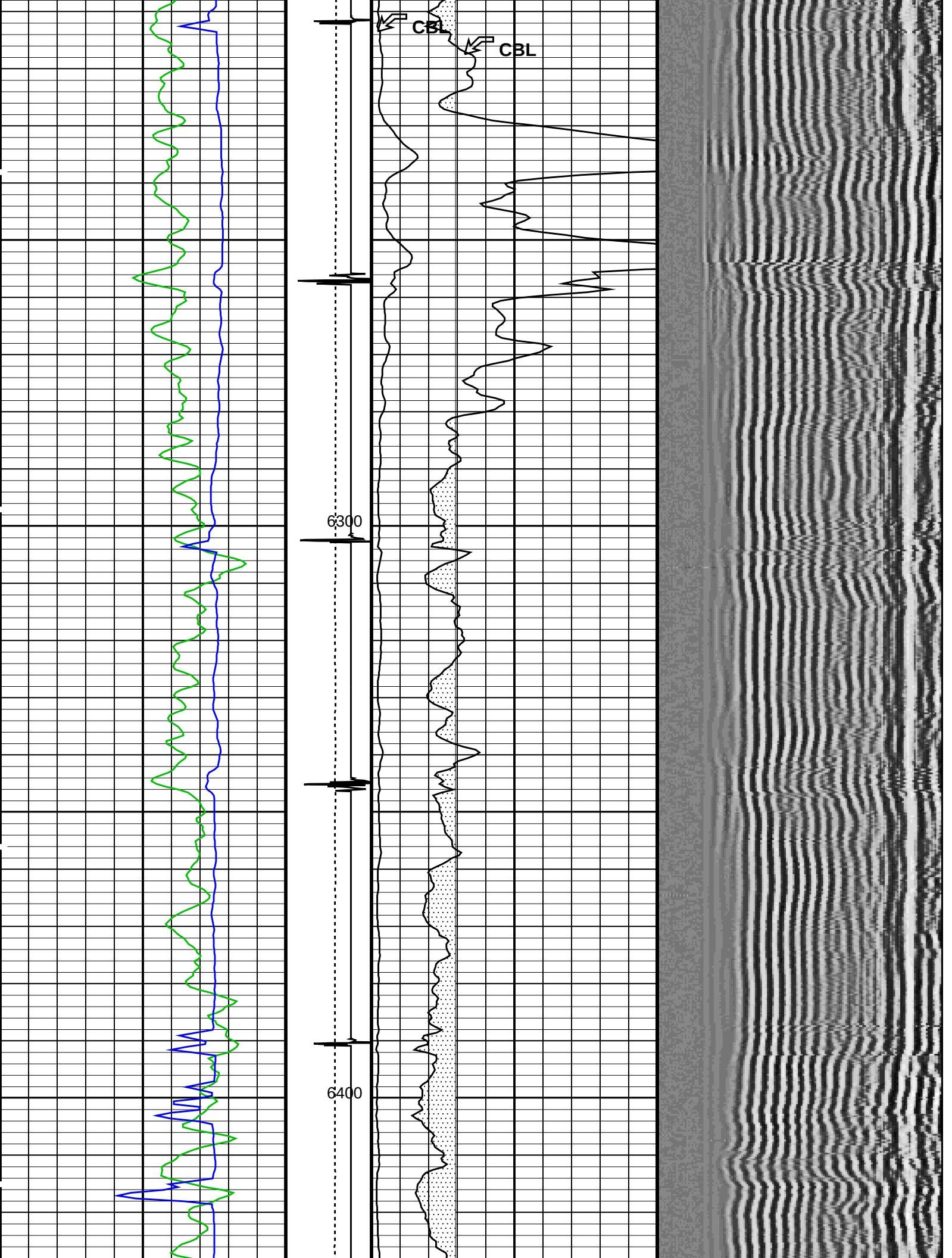
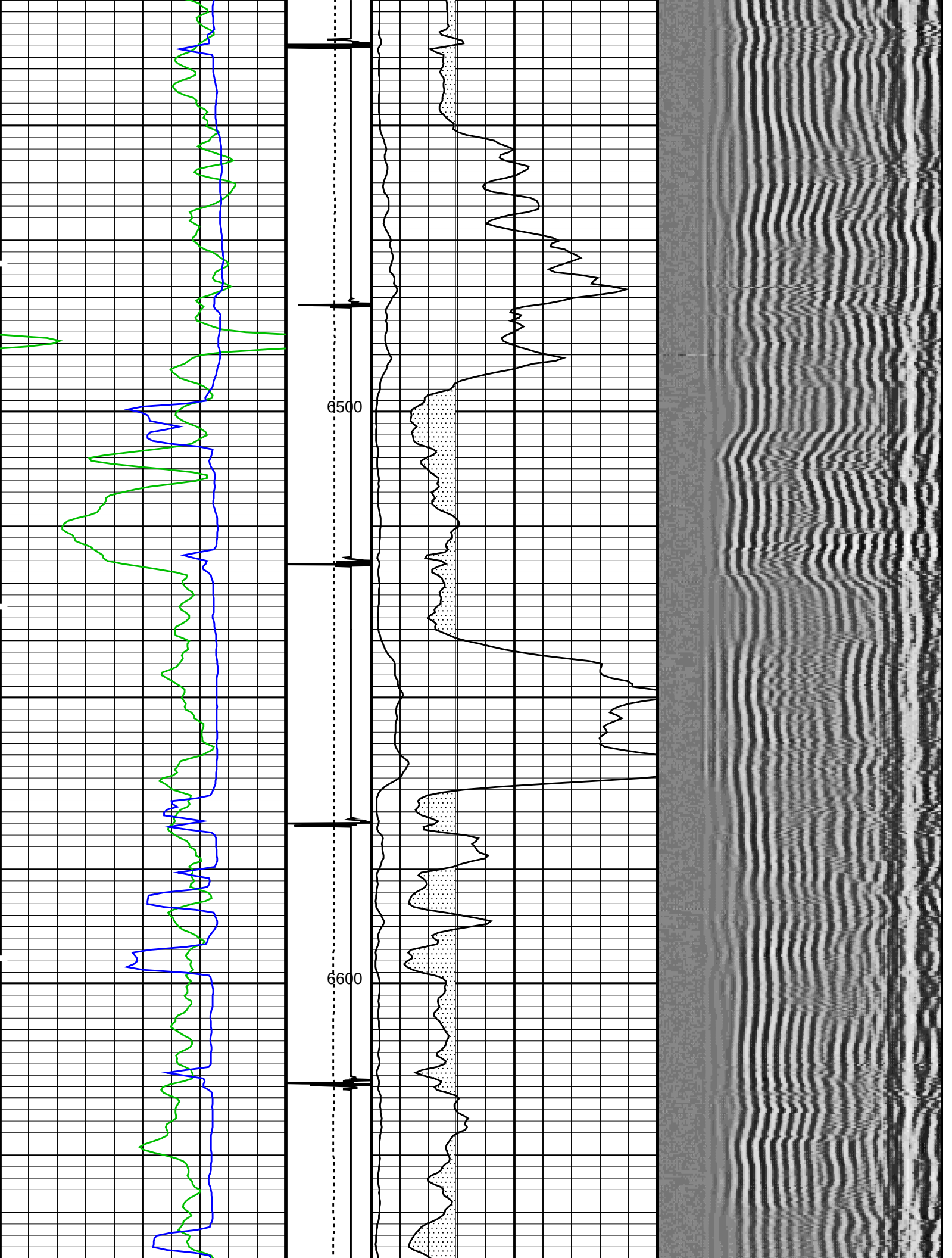
5900
SJ


6000
6100
6200
TT
GR
GOBO


CBL
CBL
6300
6400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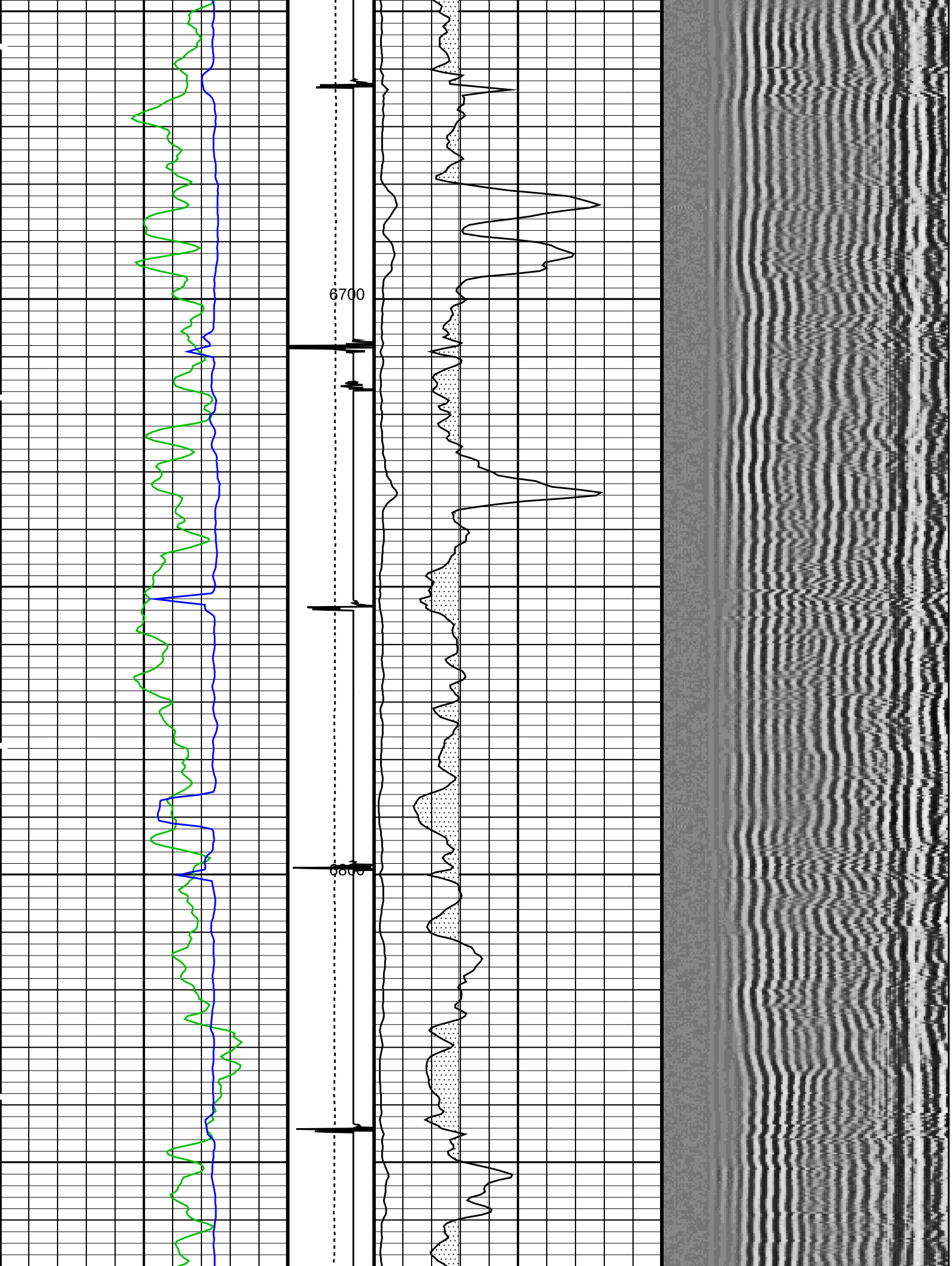
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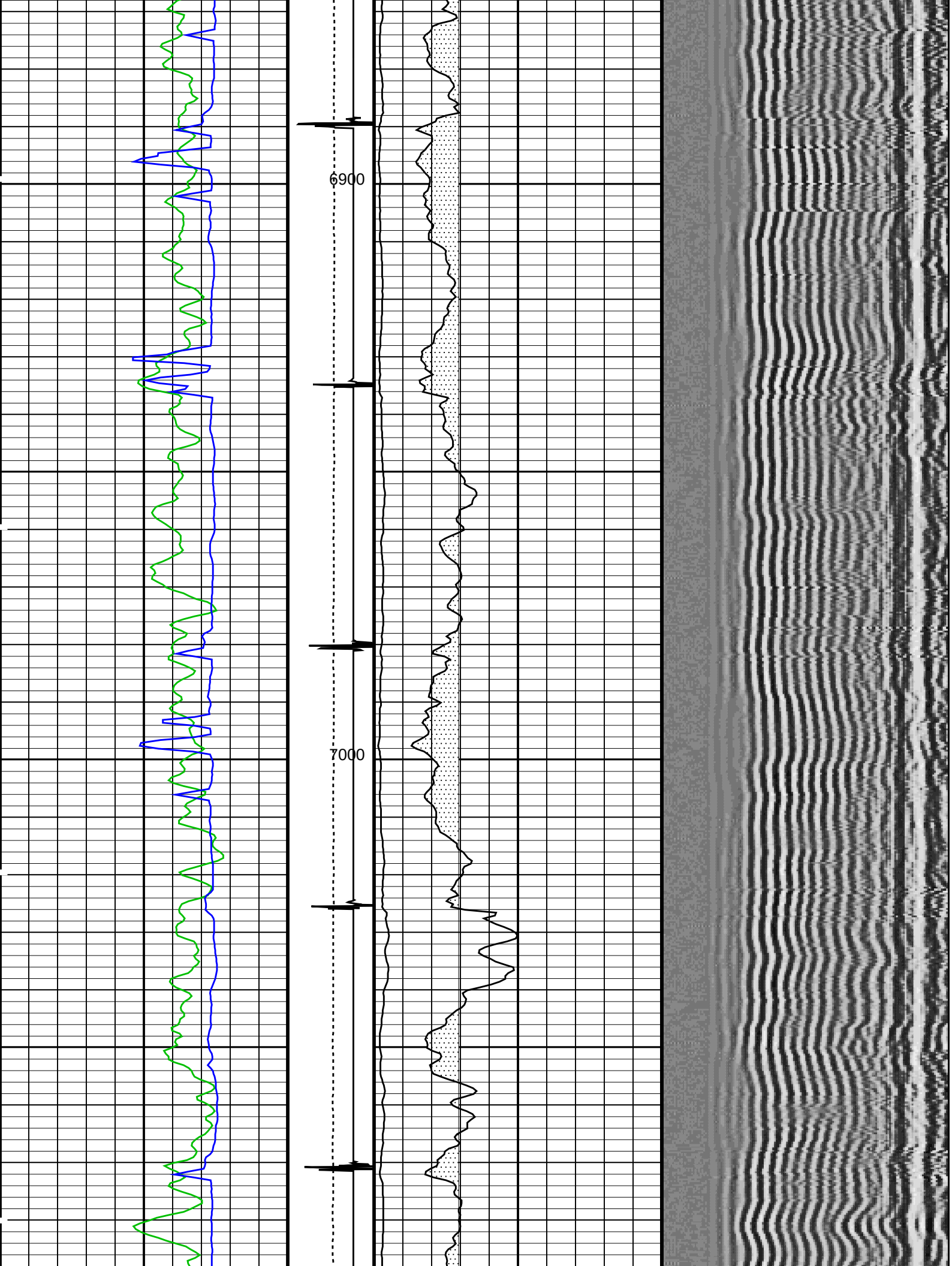
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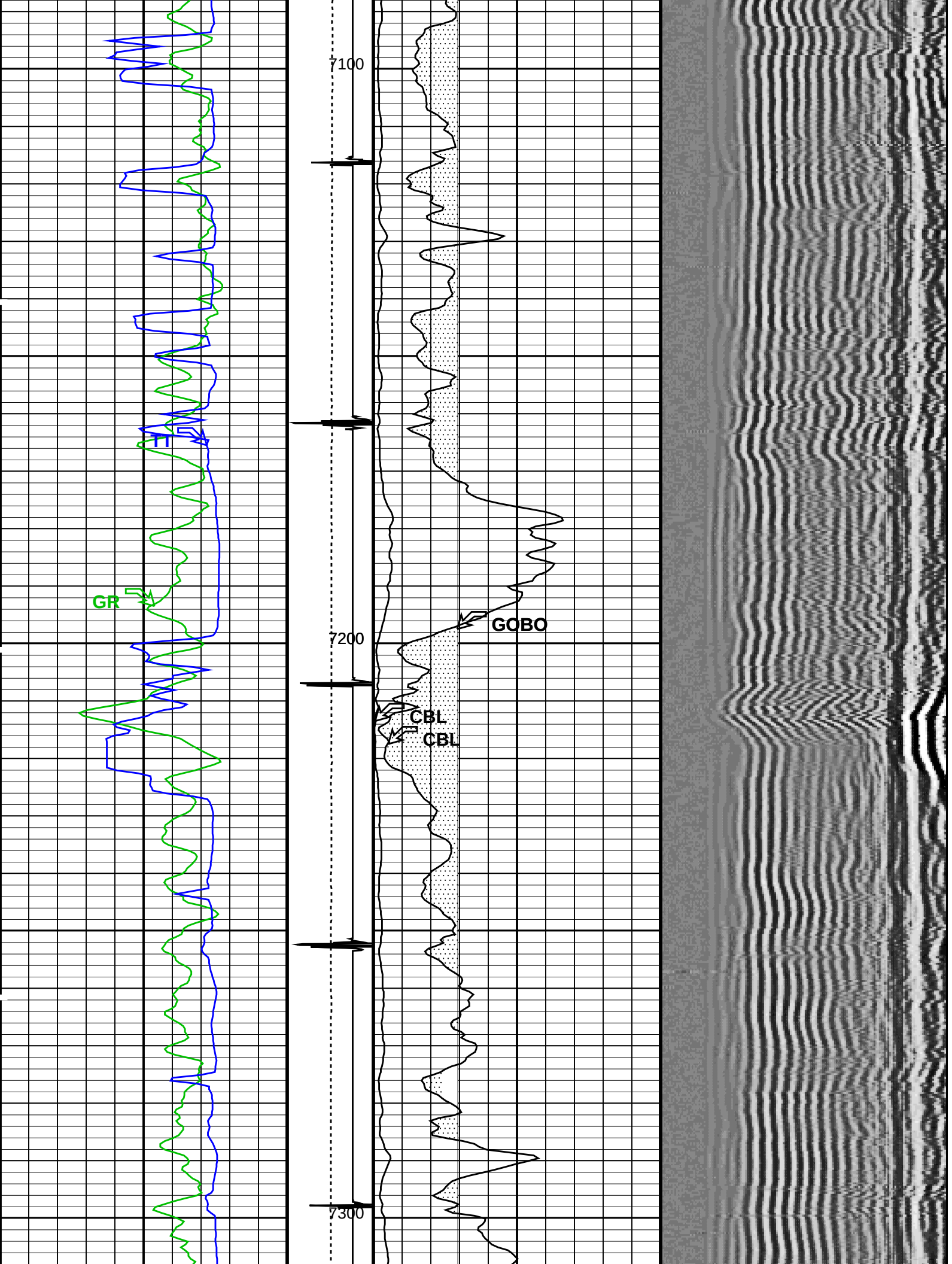
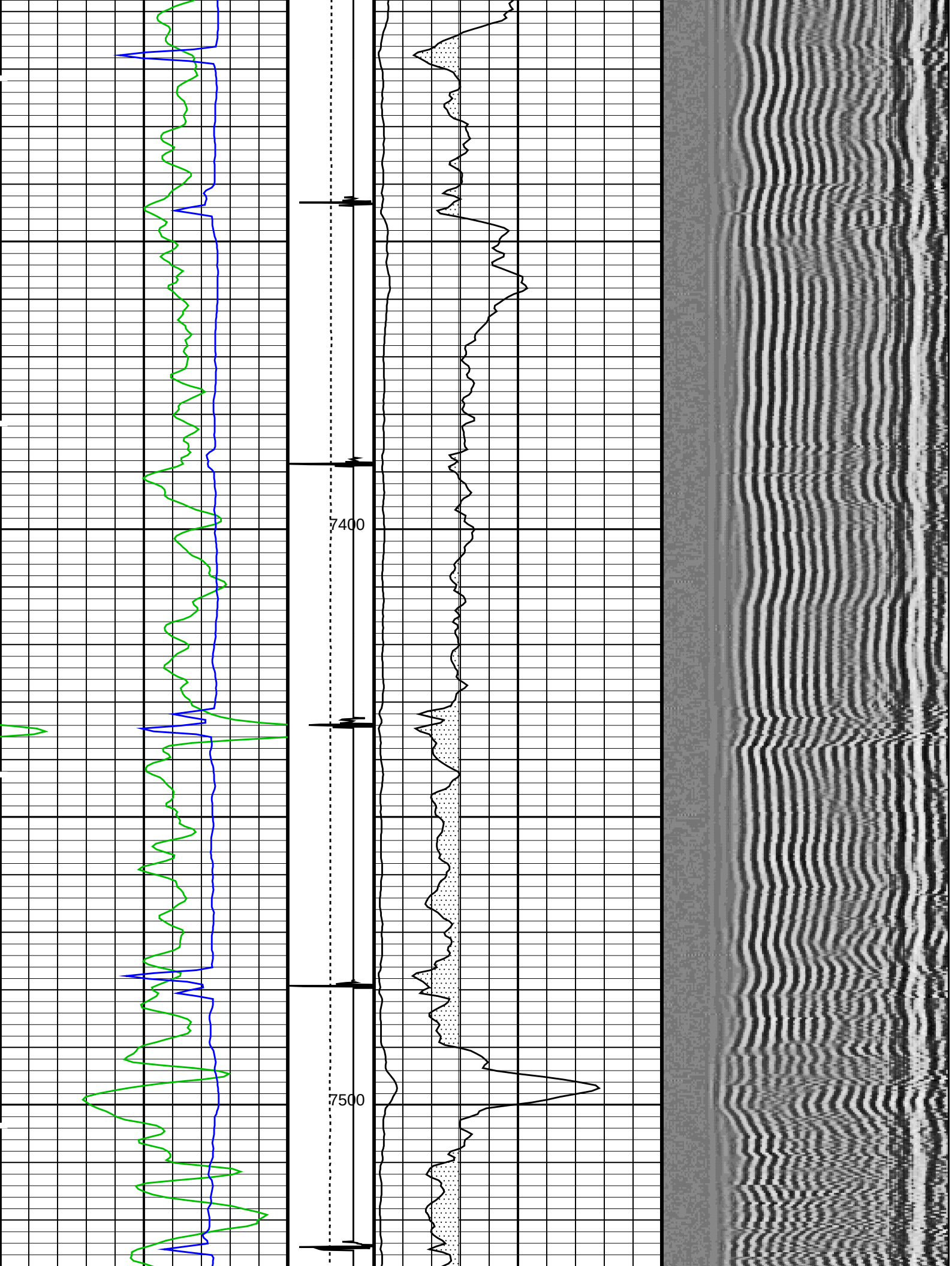

7100
7200
7300
GR
GOBO
CBL
CBL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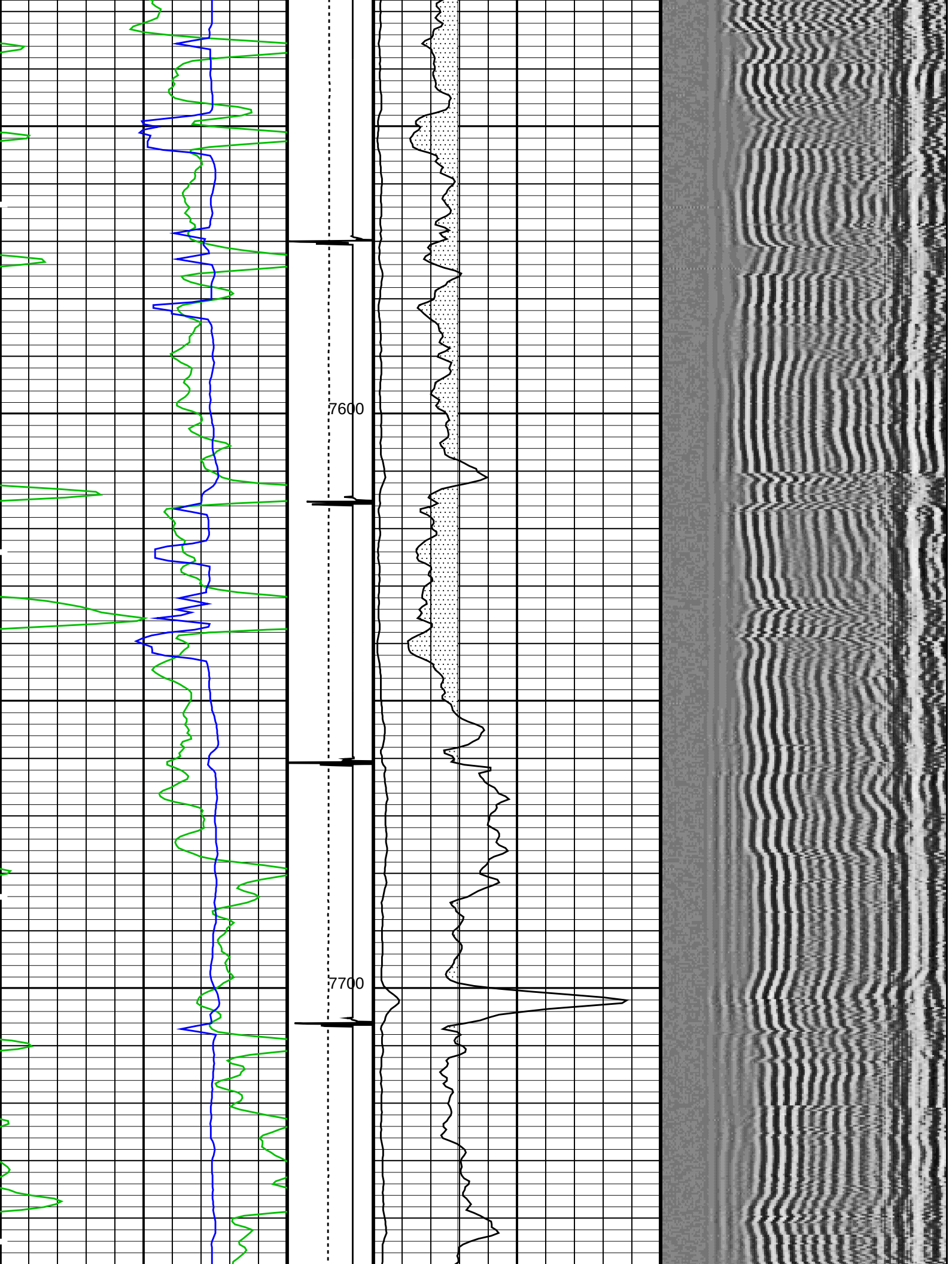
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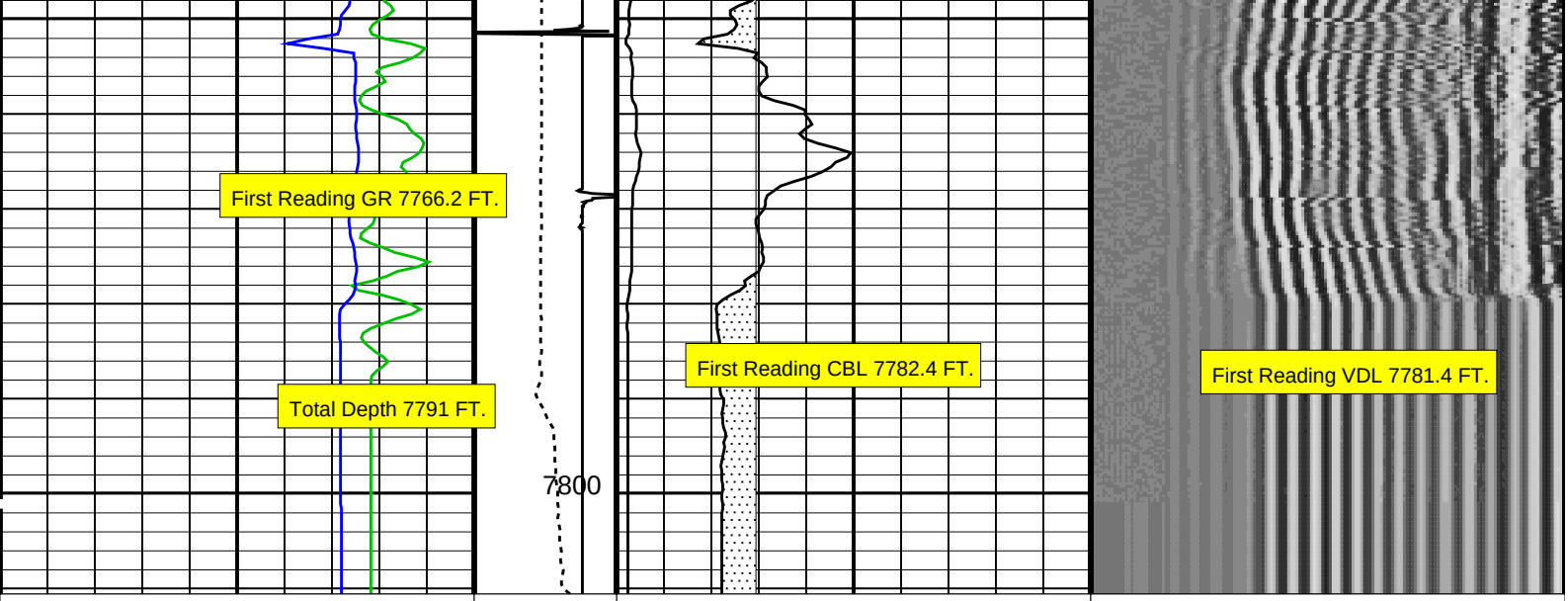


Gamma Ray (GR) 0 (GAPI) 150	Tension (TENS) (LBF) 2000 0	CBL Amplitude (CBL) 0 (MV) 10
		Min Amplitude Max VDL VariableDensity (VDL) 200 (US) 1200
Transit Time (TT) 400 (US) 200	Discriminated CCL (CCLD) 3 (V) −1	CBL Amplitude (CBL) 0 (MV) 100
		Good Bond (GOBO) 0 (MV) 10
		GoodBond From ACBL to GOBO

PIP SUMMARY

Time Mark Every 60 S

Format: CBL_VDL Vertical Scale: 5" per 100' Graphics File Created: 03−Oct−2012 11:31

OP System Version: 18C0−147

SCMT−CA 18C0−147 PSPT 18C0−147

<<<SCMT Cement Evaluation Information Summary>>>

Sonde Serial Number	SCMS−CA 8140		
Current Casing Size	4.50000 IN		
Casing Weight	13.5000 LB/F		
Expected CBL Amplitude in Free Pipe Section	81 MV	Minimum Sonic Amplitude	1.27514 MV (100% Cement) 2.92512 MV (80% Cement)
		MAP Minimum Sonic Amplitude	7.06034 MV (100% Cement) 11.9967 MV (80% Cement)
Master Calibration (Normalization)		Before Calibration (Adjustment)	
Date of Master Calibration	15−SEP−2011		
CBL Correction Factor	0.0743716	CBL Adjustment Factor (CBAF)	0.840000
MAP 1 Correction Factor	0.112485	MAP Adjustment Factor (MPAF)	1.0
MAP 2 Correction Factor	0.117478		
MAP 3 Correction Factor	0.116895		
MAP 4 Correction Factor	0.104208		
MAP 5 Correction Factor	0.108814		
MAP 6 Correction Factor	0.117661		
MAP 7 Correction Factor	0.126110		

MAP 7 Correction Factor	0.126110
MAP 8 Correction Factor	0.114385

Parameters

DLIS Name	Description	Value	
	SCMT−CA: Slim Cement Mapping Tool, 1−11/16 OD		
BILI	Bond Index Level for Zone Isolation	0.8	
CB3D	SCMT CBL 3 ft Peak Detection Mode	PEAK	
CB3G	SCMT CBL 3 ft Peak Detection T0_Delay and Noise Gate	226.949	US
CB3T	SCMT CBL 3 ft Fixed Threshold Level	20	MV
CB5D	SCMT CBL 5 ft Peak Detection Mode	PEAK	
CB5G	SCMT CBL 5 ft Peak Detection T0_Delay and Noise Gate	340.949	US
CB5T	SCMT CBL 5 ft Fixed Threshold Level	20	MV
CBLG	CBL Gate Width	40	US
CBRA	CBL LQC Reference Amplitude in Free Pipe	81	MV
CMCF	CBL Cement Type Compensation Factor	1	
CMTC	SCMT Slow Channel Multiplexer Mode	SCAN	
CMTM	SCMT Operating Mode	LOG	
CSCS	SCMT Slow Channel Index	VCC	
CTHI	Casing Thickness	0.300677	IN
DTF	Delta−T Fluid	204.5	US/F
FATT	Acoustic Attenuation due to Fluid	0	DB/F
FCF	CBL Fluid Compensation Factor	1.01213	
GOBO	Good Bond	2.92512	MV
MAPD	SCMT MAP Peak Detection Mode	PEAK	
MAPG	SCMT MAP Peak Detection T0_Delay and Noise Gate	169.949	US
MAPT	SCMT MAP Fixed Threshold Level	30	MV
MATT	Maximum Attenuation	14.0905	DB/F
MCCF	MAP Cement Type Compensation Factor	1	
MCI	Minimum Cemented Interval for Isolation	1.25	FT
MMSA	MAP Minimum Sonic Amplitude	7.06034	MV
MSA	Minimum Sonic Amplitude	1.27514	MV
PEDE	Peak Detection On/Off Switch in Playback	OFF	
VDLG	VDL Manual Gain	5	
ZCMT	Acoustic Impedance of Cement	6.8	MRAY
	System and Miscellaneous		
CSIZ	Current Casing Size	4.500	IN
CWEI	Casing Weight	13.50	LB/F
DFD	Drilling Fluid Density	8.30	LB/G
TD	Total Depth	7880	FT

Output DLIS Files

DEFAULT	SCMT_PSP_005LUP	FN:4	PRODUCER	03−Oct−2012 11:31		

Schlumberger

REPEAT PASS

MAXIS Field Log

Company: QUICKSILVER RESOURCES INC. Well: PIRTLAW PARTNERS LTD 24−33

Input DLIS Files

DEFAULT	SCMT_PSP_004LUP	FN:3	PRODUCER	03−Oct−2012 11:20	7809.0 FT	7480.1 FT

Output DLIS Files

DEFAULT	SCMT_PSP_006PUP	FN:5	PRODUCER	03−Oct−2012 12:57	7810.5 FT	7482.0 FT

OP System Version: 18C0−147

SCMT−CA	18C0−147	PSPT	18C0−147

PIP SUMMARY

Time Mark Every 60 S

GoodBond
From ACBL to GOBO

Good Bond (GOBO)
0 (MV) 10

Transit Time (TT)
400 (US) 200

Discriminated CCL (CCLD)
3 (V) −1

CBL Amplitude (CBL)
0 (MV) 100

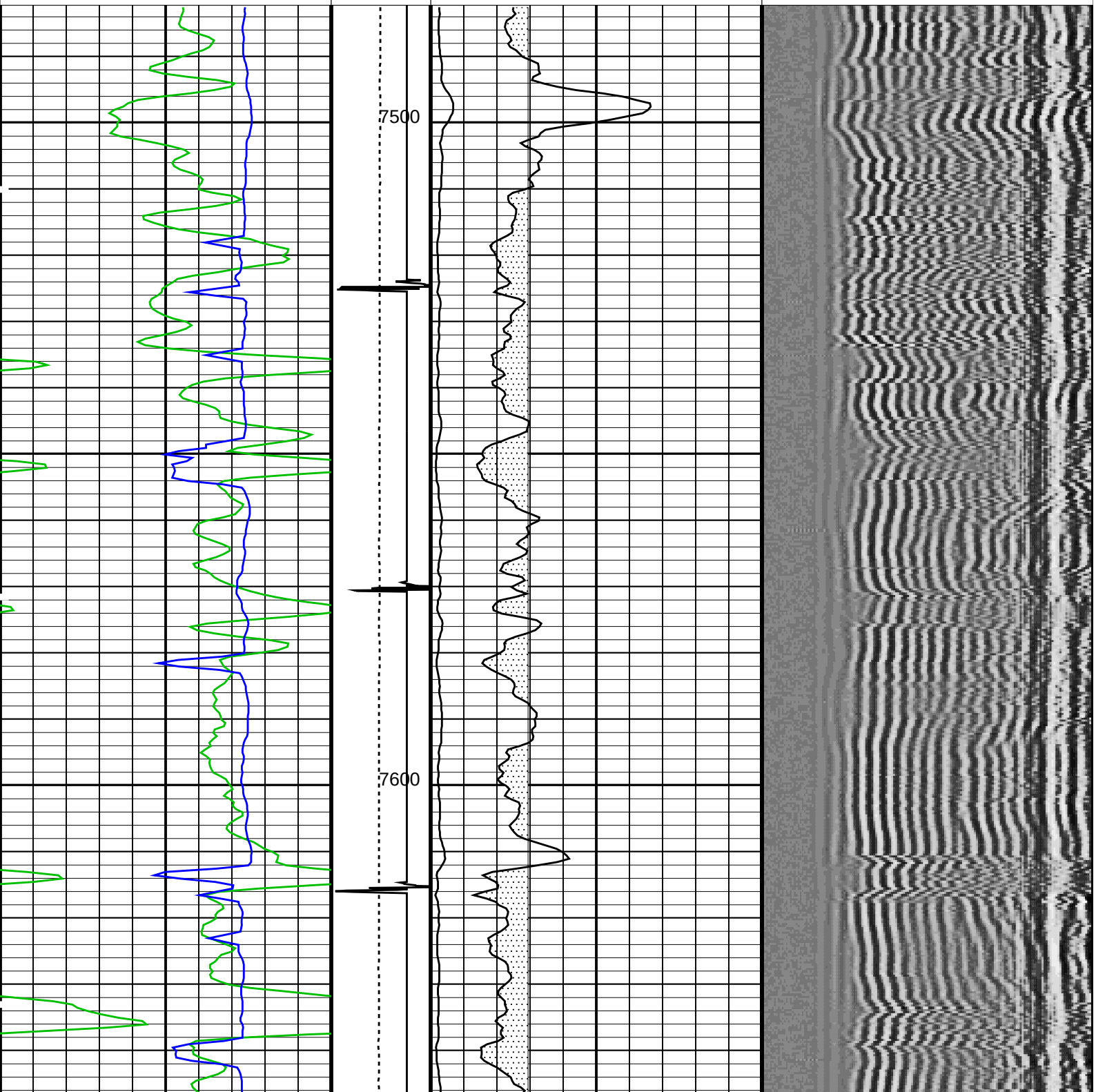
Gamma Ray (GR)
0 (GAPI) 150

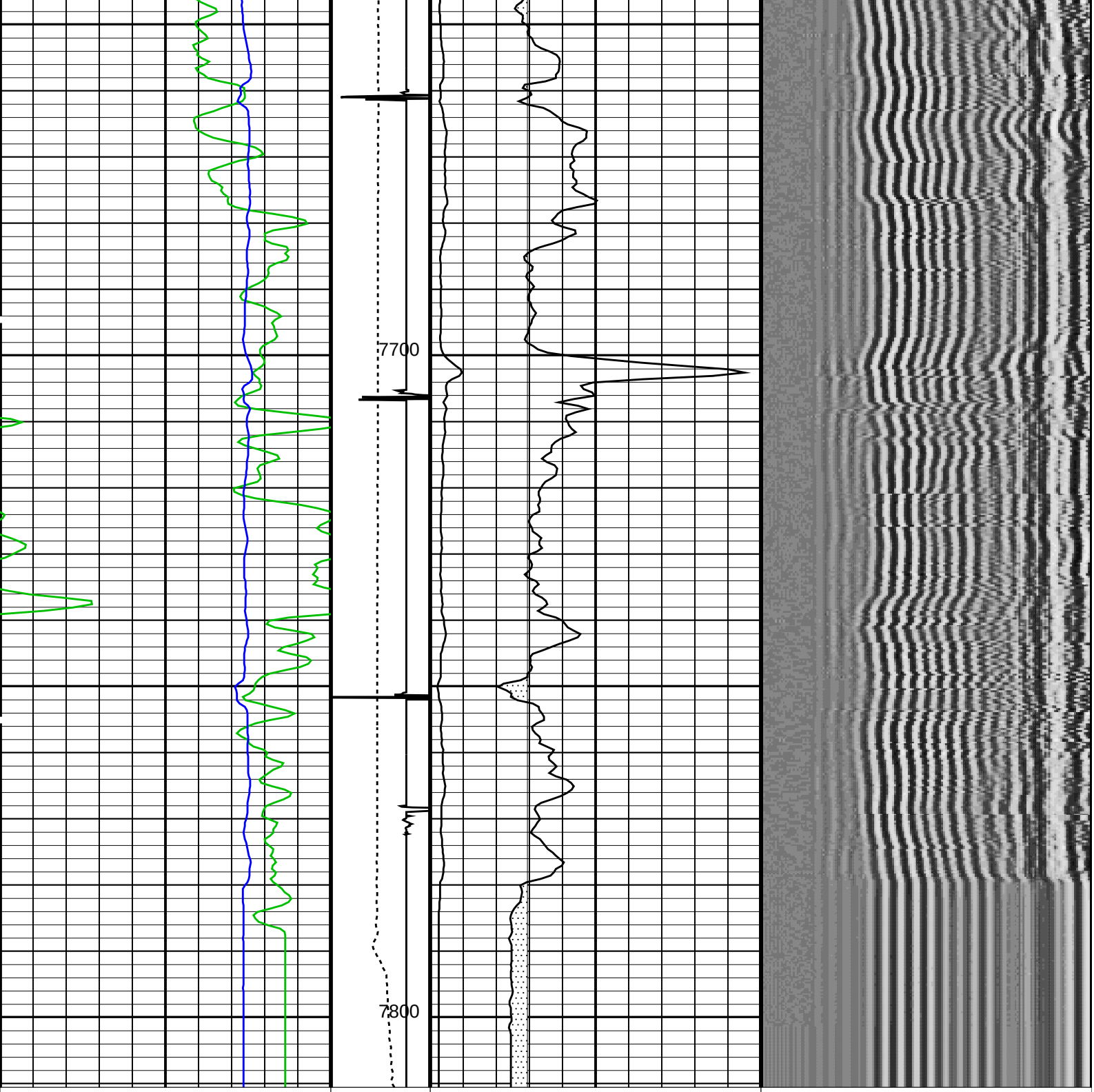
Tension (TENS)
2000 (LBF) 0

CBL Amplitude (CBL)
0 (MV) 10

Min Amplitude Max

VDL VariableDensity (VDL)
200 (US) 1200





Gamma Ray (GR) 0 (GAPI) 150	Tension (TENS) (LBF) 2000 0	CBL Amplitude (CBL) 0 (MV) 10
Transit Time (TT) 400 (US) 200	Discriminated CCL (CCLD) 3 (V) −1	CBL Amplitude (CBL) 0 (MV) 100
		Good Bond (GOBO) 0 (MV) 10 GoodBond From ACBL to GOBO

Min Amplitude Max

VDL VariableDensity (VDL)
200 (US) 1200

PIP SUMMARY

Time Mark Every 60 S

Format: CBL_VDL Vertical Scale: 5" per 100' Graphics File Created: 03−Oct−2012 12:57

OP System Version: 18C0−147

SCMT−CA 18C0−147 PSPT 18C0−147

<<<SCMT Cement Evaluation Information Summary>>>

Sonde Serial Number	SCMS−CA 8140		
Current Casing Size	4.50000 IN		
Casing Weight	13.5000 LB/F		
Expected CBL Amplitude in Free Pipe Section	81 MV	Minimum Sonic Amplitude	1.27514 MV (100% Cement)
			2.92512 MV (80% Cement)
		MAP Minimum Sonic Amplitude	7.06034 MV (100% Cement)
			11.9967 MV (80% Cement)
Master Calibration (Normalization)		Before Calibration (Adjustment)	
Date of Master Calibration	15−SEP−2011		
CBL Correction Factor	0.0743716	CBL Adjustment Factor (CBAF)	0.840000
MAP 1 Correction Factor	0.112485	MAP Adjustment Factor (MPAF)	1.0
MAP 2 Correction Factor	0.117478		
MAP 3 Correction Factor	0.116895		
MAP 4 Correction Factor	0.104208		
MAP 5 Correction Factor	0.108814		
MAP 6 Correction Factor	0.117661		
MAP 7 Correction Factor	0.126110		
MAP 8 Correction Factor	0.114385		

Parameters

DLIS Name	Description	Value	
	SCMT−CA: Slim Cement Mapping Tool, 1−11/16 OD		
BILI	Bond Index Level for Zone Isolation	0.8	
CB3D	SCMT CBL 3 ft Peak Detection Mode	PEAK	
CB3G	SCMT CBL 3 ft Peak Detection T0_Delay and Noise Gate	226.949	US
CB3T	SCMT CBL 3 ft Fixed Threshold Level	20	MV
CB5D	SCMT CBL 5 ft Peak Detection Mode	PEAK	
CB5G	SCMT CBL 5 ft Peak Detection T0_Delay and Noise Gate	340.949	US
CB5T	SCMT CBL 5 ft Fixed Threshold Level	20	MV
CBLG	CBL Gate Width	40	US
CBRA	CBL LQC Reference Amplitude in Free Pipe	81	MV
CMCF	CBL Cement Type Compensation Factor	1	
CMTC	SCMT Slow Channel Multiplexer Mode	SCAN	
CMTM	SCMT Operating Mode	LOG	
CSCS	SCMT Slow Channel Index	VCC	
CTHI	Casing Thickness	0.300677	IN
DTF	Delta−T Fluid	204.5	US/F
FATT	Acoustic Attenuation due to Fluid	0	DB/F
FCF	CBL Fluid Compensation Factor	1.01213	
GOBO	Good Bond	2.92512	MV
MAPD	SCMT MAP Peak Detection Mode	PEAK	
MAPG	SCMT MAP Peak Detection T0_Delay and Noise Gate	169.949	US
MAPT	SCMT MAP Fixed Threshold Level	30	MV
MATT	Maximum Attenuation	14.0905	DB/F
MCCF	MAP Cement Type Compensation Factor	1	
MCI	Minimum Cemented Interval for Isolation	1.25	FT
MMSA	MAP Minimum Sonic Amplitude	7.06034	MV
MSA	Minimum Sonic Amplitude	1.27514	MV
PEDE	Peak Detection On/Off Switch in Playback	OFF	
VDLG	VDL Manual Gain	5	
ZCMT	Acoustic Impedance of Cement	6.8	MRAY
	System and Miscellaneous		
CSIZ	Current Casing Size	4.500	IN
CWEI	Casing Weight	13.50	LB/F
DFD	Drilling Fluid Density	8.30	LB/G
DO	Depth Offset for Playback	1.6	FT
PP	Playback Processing	RECOMPUTE	
TD	Total Depth	7880	FT

TD Total Depth 7880 FT

Input DLIS Files

DEFAULT	SCMT_PSP_004LUP	FN:3	PRODUCER	03−Oct−2012 11:20	7809.0 FT	7480.1 FT

Output DLIS Files

DEFAULT	SCMT_PSP_006PUP	FN:5	PRODUCER	03−Oct−2012 12:57

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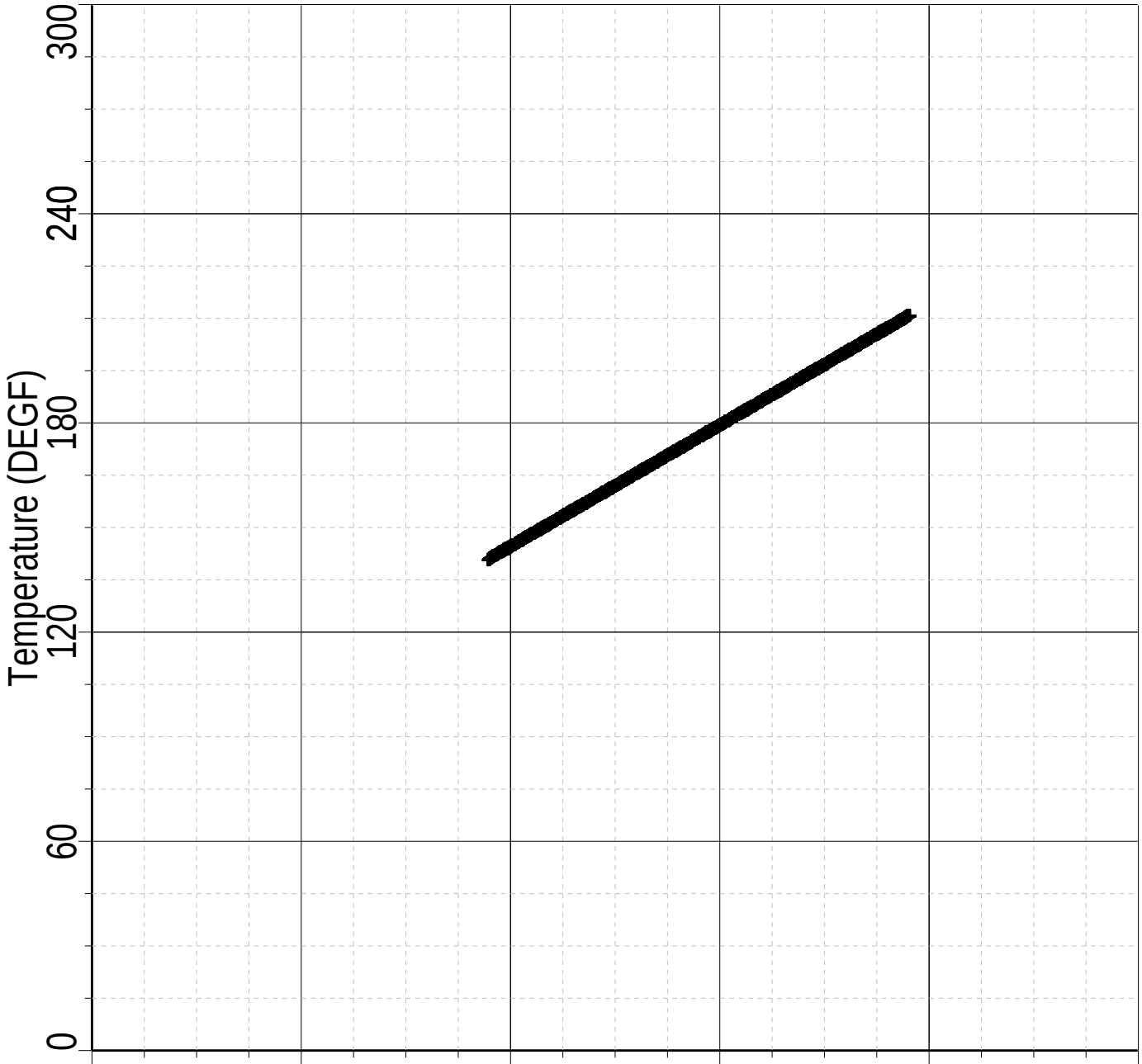
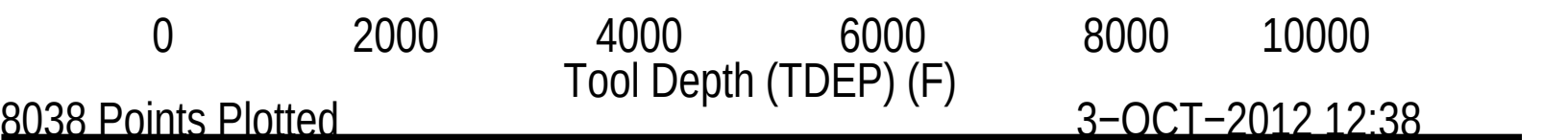
TEMPERATURE PLOT

MAXIS Field Log

Index: 7810.5 − 3792.0 FT





8038 Points Plotted 3−OCT−2012 12:38

Company: **QUICKSILVER RESOURCES INC.**

Schlumberger

Well: **PIRTLAW PARTNERS LTD 24−33**
Field: **WILDCAT**
County: **ROUTT**
State: **COLORADO**

CEMENT BOND LOG
GAMMA RAY
TEMPERATURE/CCL