



**GAMMA RAY  
NEUTRON  
LOG**

Comp. FG HOLL COMPANY LLC  
Well KRUCKENBERG #1-18  
Field HEIZER WEST  
Co. BARTON  
State KANSAS

Company **FG HOLL COMPANY LLC**  
Well **KRUCKENBERG #1-18**  
Field **HEIZER WEST**  
County **BARTON** State **KANSAS**

Location: 600' FNL & 660' FEL  
SEC 18 TWP 19S RGE 14W  
Permanent Datum GROUND LEVEL  
Log Measured From 8' Above Perm. Datum  
Drilling Measured From KELLY BUSHING  
Elevation 1908'  
K.B. 1916'  
D.F. N/A  
G.L. 1908'

Date of Service	08/21/2018	Other Services	SCBL
Run Number	ONE		
Depth Driller or PBTD	3750'		
Depth Logger	3724'		
Bottom Log Interval	3722'		
Top Log Interval	00'		
Open Hole Size	7.875"		
Type Fluid	WATER		
Fluid Level	FULL		
Fluid Density	N/A		
Max. Recorded Temperature	N/A		
Max. Wellhead Pressure	00 PSI		
Wellhead Connection	FLOWTEE		
Estimated Cement Top	3640'		
Unit Number	106		
Wireline Size	.288		
Location	HAYS KANSAS		
Recorded By	D.SCHMIDT		
Witnessed By	ROB LONG		
Tubing Record	Size	Wt/Ft	Top
Surface Casing	8.625"	23#	00'
Production Casing	5.5"	17#	00'
Liner Record			Bottom
			854'
			TD

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All interpretations are opinions based on inferences from electrical or other measurements and Pioneer Wireline Services, LLC cannot and does not guarantee the accuracy or correctness of any interpretation, and Pioneer Wireline Services, LLC will not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees.

**Comments**

N/A DENOTES NOT AVAILABLE OR NON-APPLICABLE.

HEIZER,  
WEST TO 70TH, SOUTH TO 30TH, 1/8 WEST,  
SOUTH INTO

THANK YOU FOR USING PIONEER ENERGY SERVICES!

Your Pioneer Energy Services Crew Engineer: D.SCHMIDT Operator: K.PFANNENSTIEL Operator: C.SCHULTZ Operator:	Tool Data - Services Serial Number
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Quantity	Offset (ft)	Submergence	Description	Length (ft)	O.D. (in)	Weight (lb)
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Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)	
			Cable Head-Titan_144 1 7/16" Titan Cable Head	1.03	1.44	2.00	
			Centralizer-275 Probe 2 3/4" Probe Adjustable Spring Centralizer	2.88	2.75	15.00	
TEMP	18.98						
WVFS8	16.69			PROBE-RBT-DIGITAL-RBL-DCT (PROBE-9.21-DCT) Probe 2 3/4" Radii Bond with Temp-Corrosion Package	2.75		105.00
WVFS7	16.69						
WVFS6	16.69						
WVFS5	16.69						
WVFS4	16.69						
WVFS3	16.69						
WVFS2	16.69						
WVFS1	16.69						
WVFCAL	16.69						
WVF3FT	16.69						
WVF5FT	15.69						
HEADVOLT	12.50			Centralizer-275 Probe 2 3/4" Probe Adjustable Spring Centralizer	2.88	2.75	15.00
CCL	8.72						
GR	7.42		PROBE-GR/CCL-DIGITAL-275 Probe GR-4.54 (Prob2.755-GR-60.00) Probe 2 3/4" Gamma Ray / CCL DIGITAL				
			Bullnose-PROBE Probe Go Pin Pressure Cap	0.33	1.38	1.00	
			NEU-PRNEU (ProbeNEU1)	4.75	1.88		
NEU	1.08						

Dataset: fghall\_kruckenberg.db: field/well/scbl/pass6  
 Total length: 25.61 ft  
 Total weight: 198.00 lb  
 O.D.: 2.75 in

# Log Variables

DatabaseC:\ProgramData\Warrior\Data\fgHall\_kruckenber.d  
 Dataset field/well/scbl/pass6/\_vars\_

## Top - Bottom

BHTEMP_Src TEMP	BOREID in 7.875	BOTTEMP degF 100	CASEOD in 5.5	CASETHCK in 0.275	CASEWGHT lb/ft 17	MAXAMPL mV 71.9	MINAMPL mV 1
MINATTN db/ft 0.8	NPORSEL Limestone	NPORSHIFT 0	PERFS 0	PPT usec 0	SRFTEMP degF 65	TDEPTH ft 3750	

## Variable Description

BHTEMP\_Src : BHTEMP Input Source Selector  
 BOREID : Borehole I.D.  
 BOTTEMP : Bottom Hole Temperature  
 CASEOD : Casing O.D.  
 CASETHCK : Casing Thickness  
 CASEWGHT : Casing Weight  
 MAXAMPL : Maximum Amplitude  
 MINAMPL : Minimum Amplitude

MINATTN : Minimum Attenuation  
 NPORSEL : Neutron Porosity Curve Select  
 NPORSHIFT : NPORSHIFT  
 PERFS : Perforation Flag  
 PPT : Predicted Pipe Time  
 SRFTEMP : Surface Temperature  
 TDEPTH : Total Depth



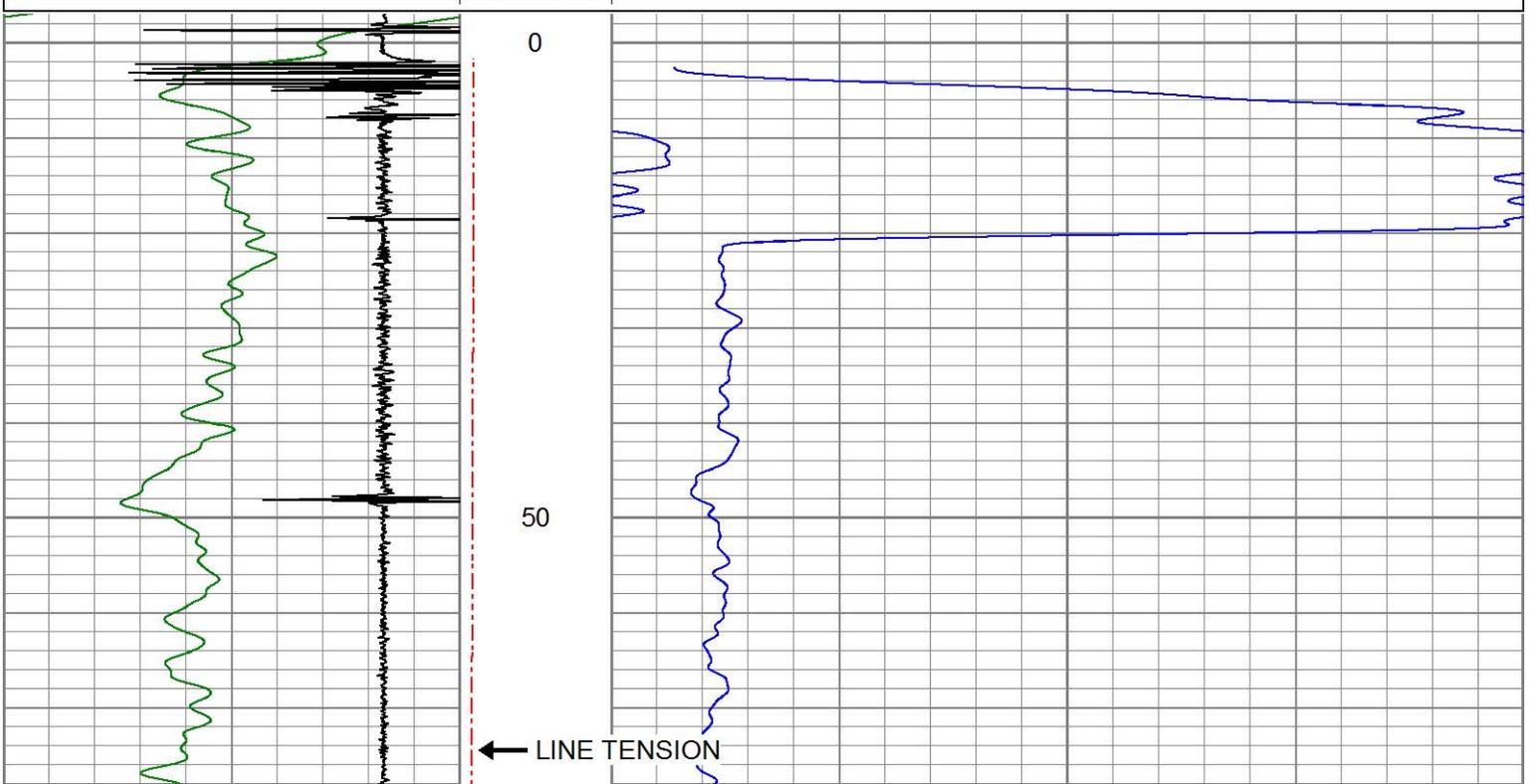
**PIONEER**  
 Pioneer Energy Services

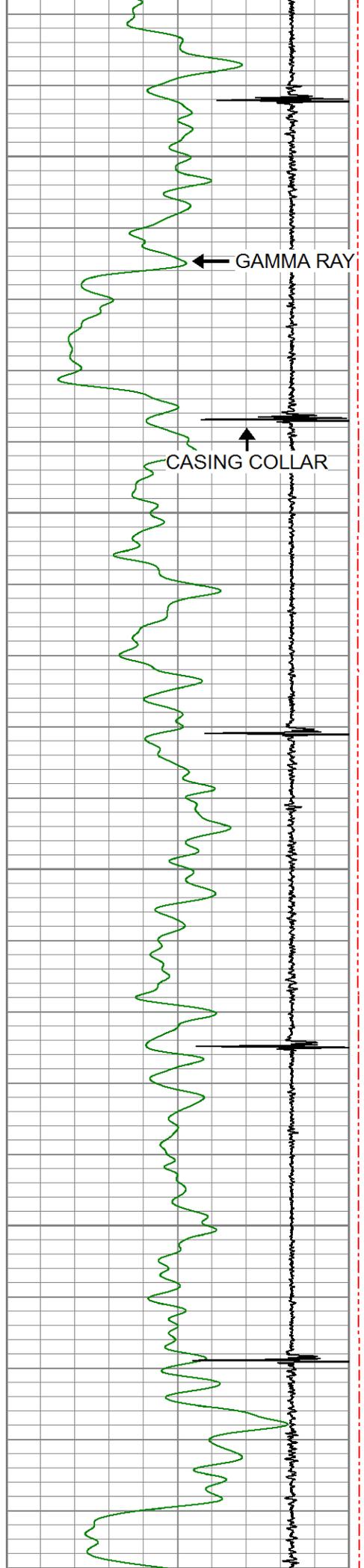
## MAIN LOG

ZERO PSI APPLIED AT SURFACE

Database File fghall\_kruckenber.d  
 Dataset Pathname scbl/pass6  
 Presentation Format PINR\_G~4  
 Dataset Creation Tue Aug 21 10:02:32 2018  
 Charted by Depth in Feet scaled 1:240

0	GR (GAPI)	150	LTEN	5	NEU (NAPI)	370
-5	CCL	1	0	(lb2000)		





100

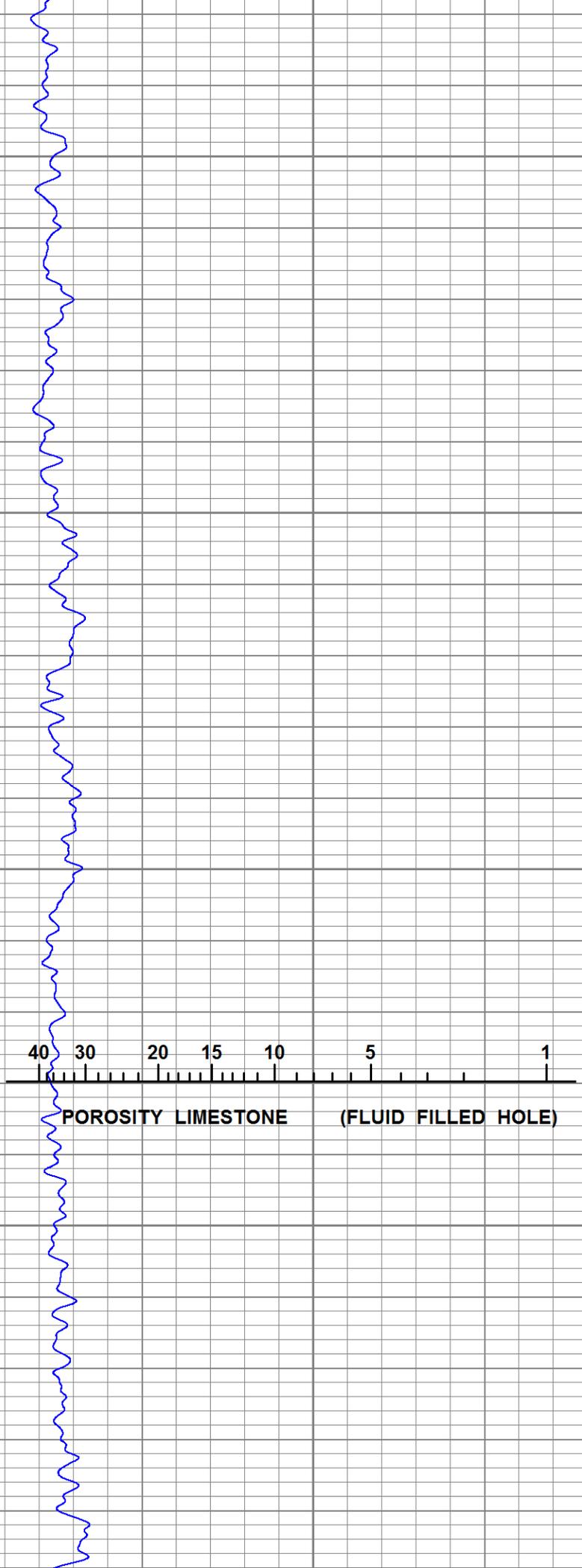
← GAMMA RAY

↑ CASING COLLAR

150

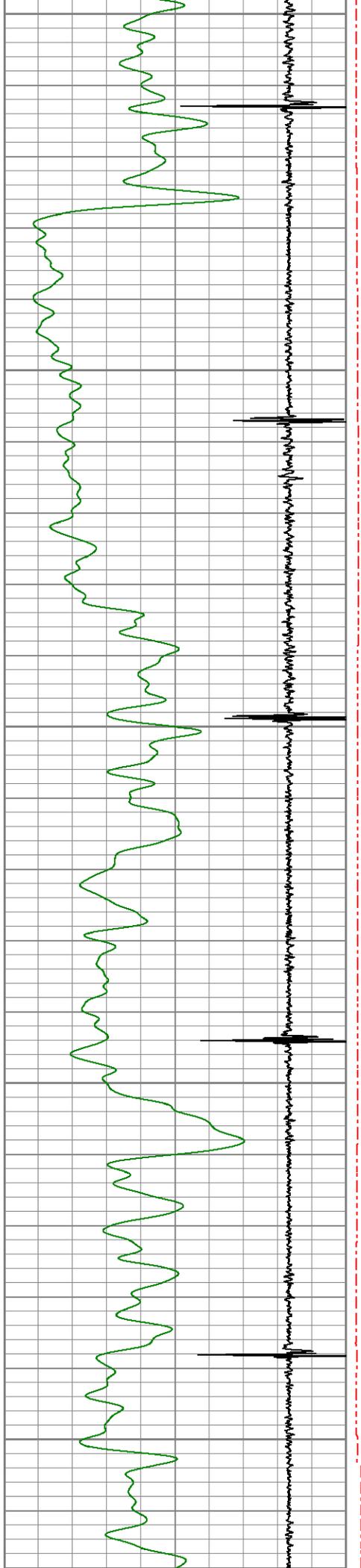
200

250

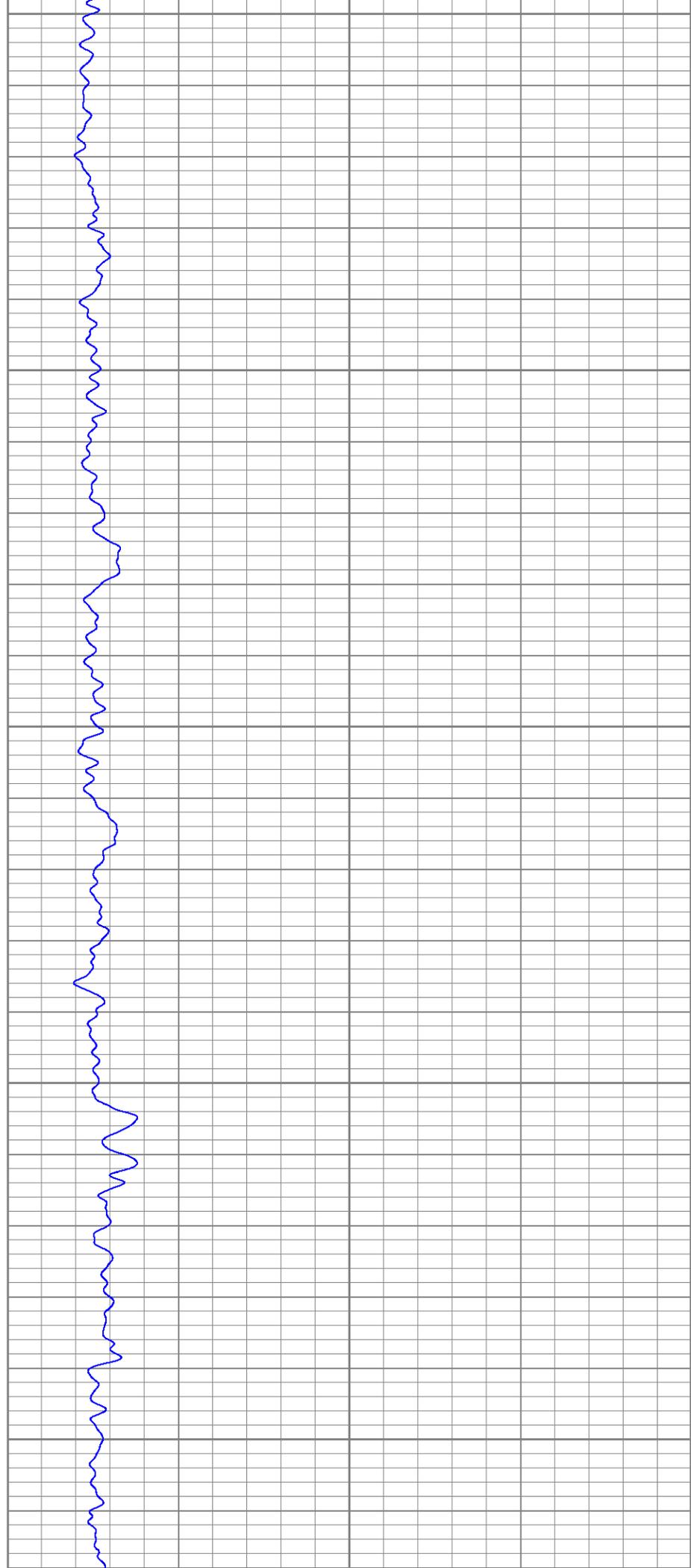


40 30 20 15 10 5 1

POROSITY LIMESTONE (FLUID FILLED HOLE)



300  
350  
400  
450  
500

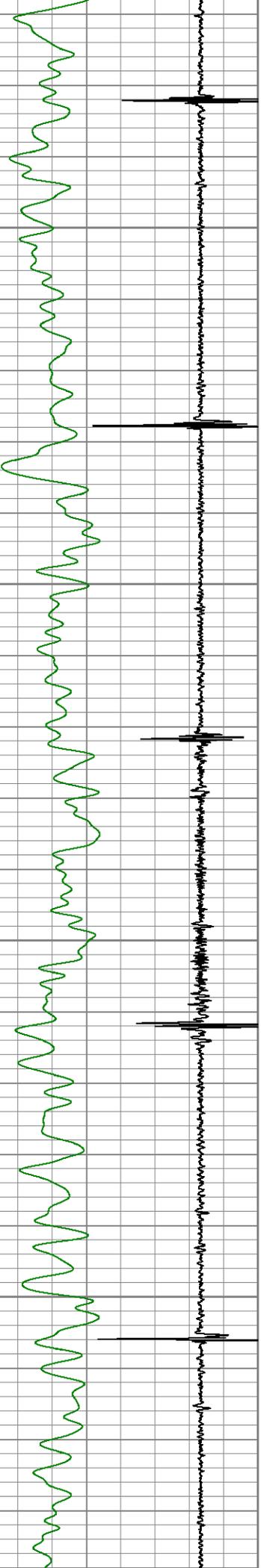
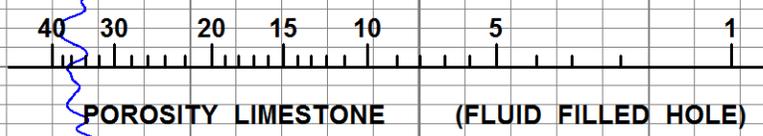


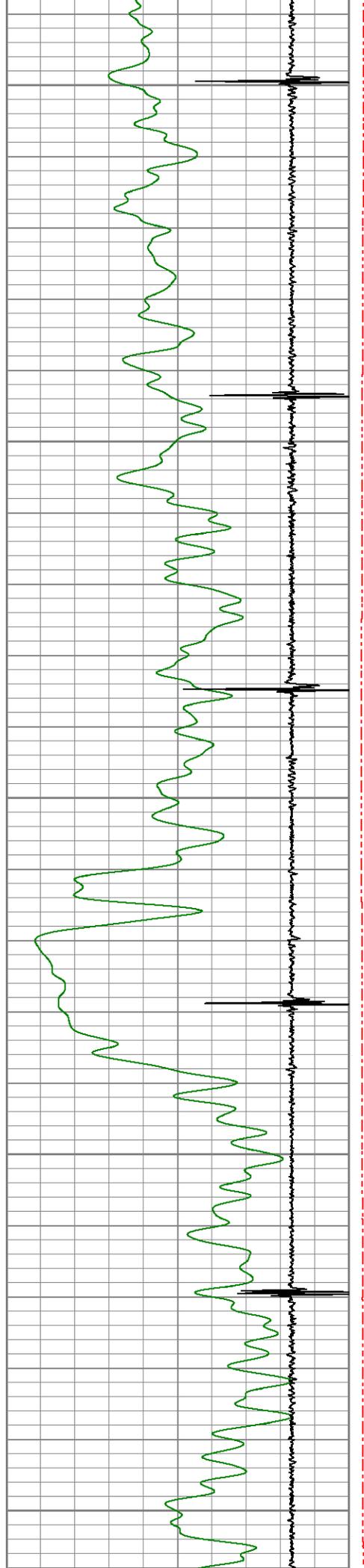
550

600

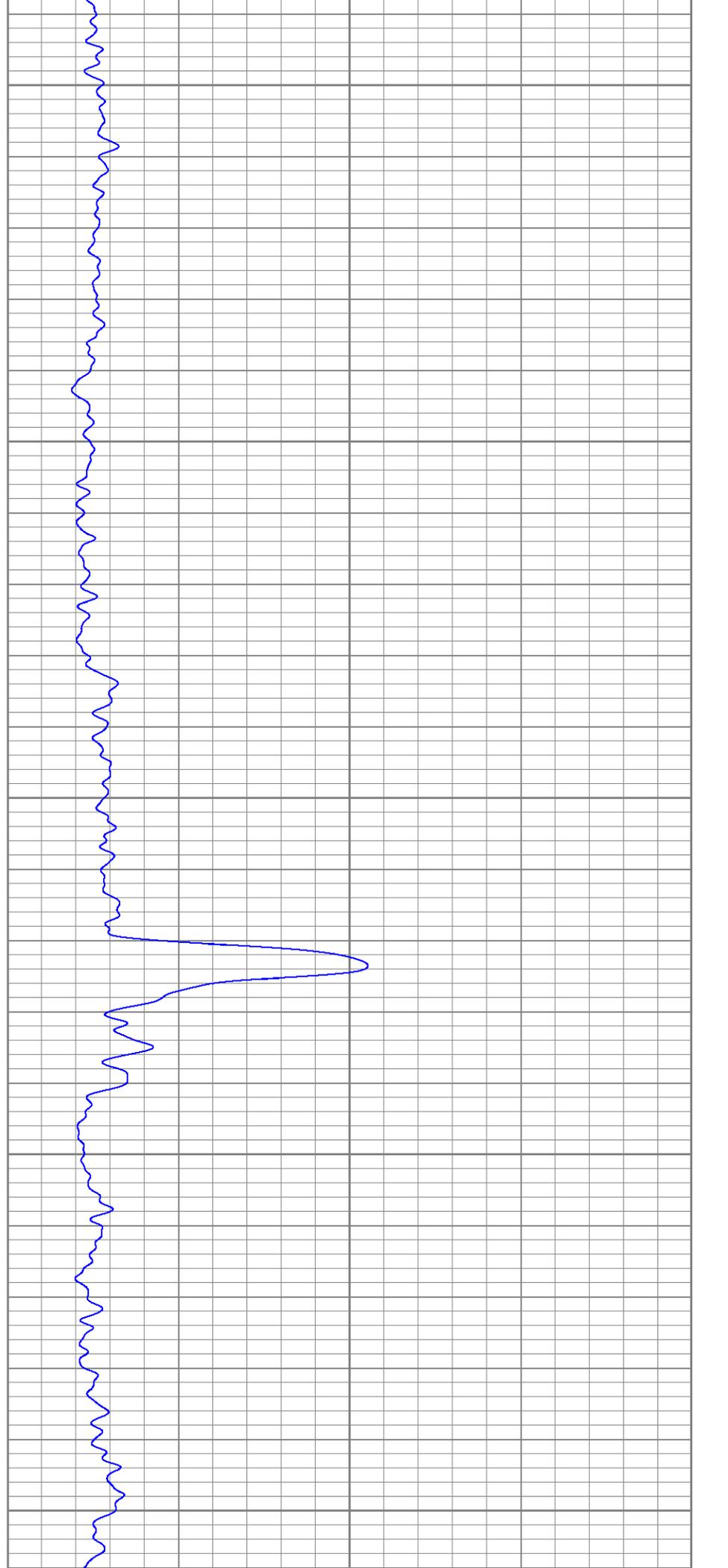
650

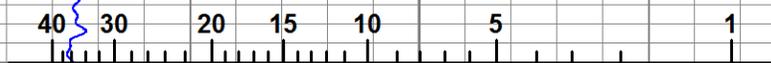
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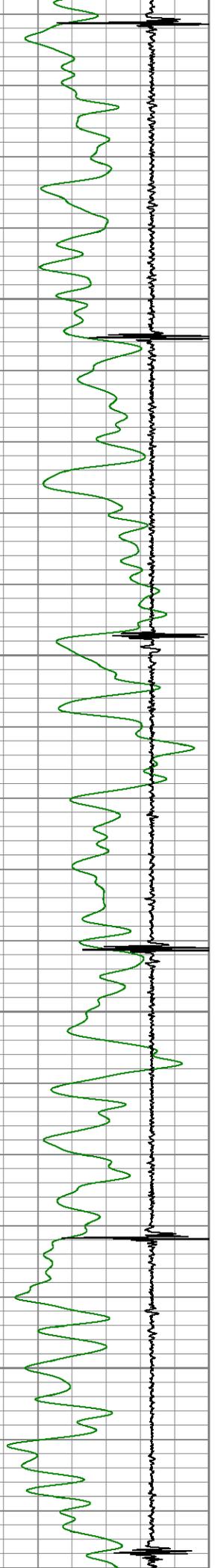


750  
800  
850  
900  
950





**POROSITY Limestone (FLUID FILLED HOLE)**

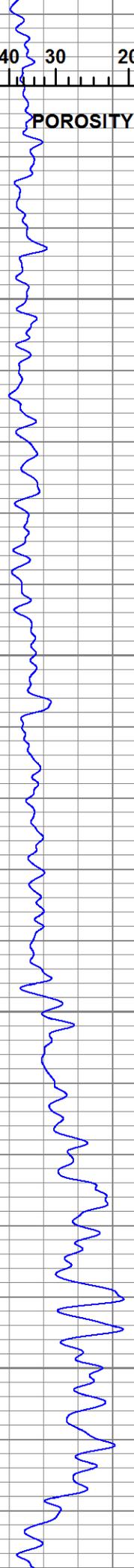


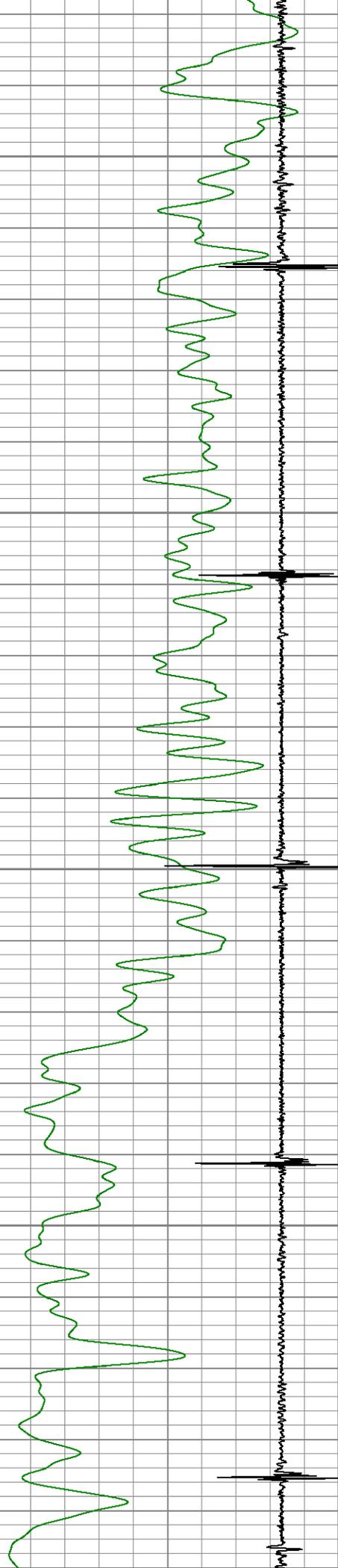
1000

1050

1100

1150



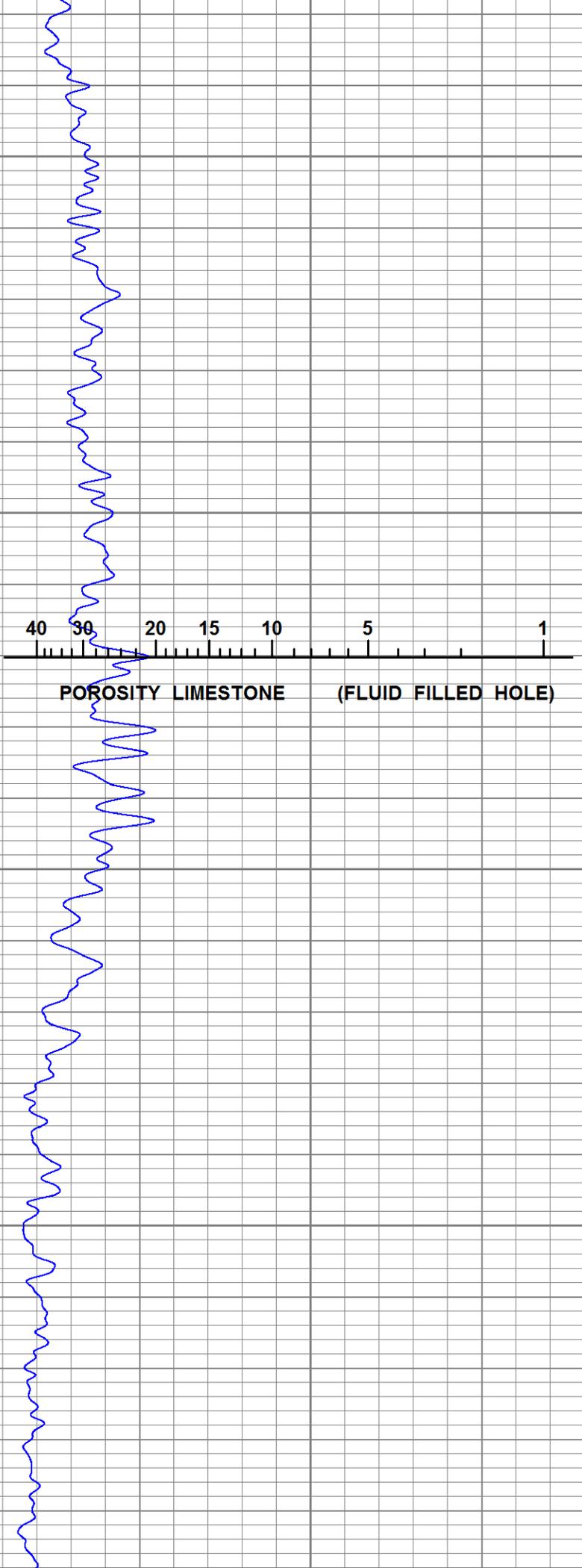


1200

1250

1300

1350



40

30

20

15

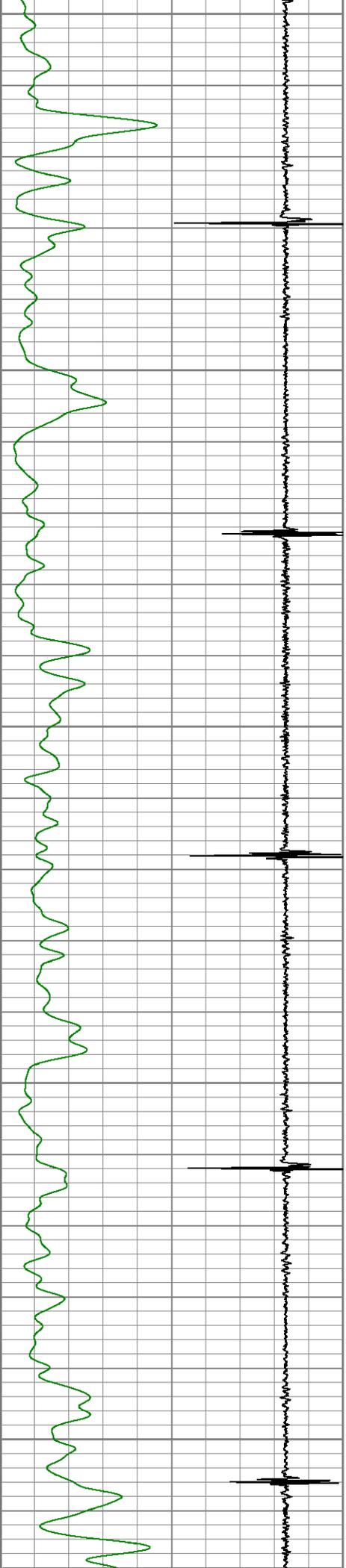
10

5

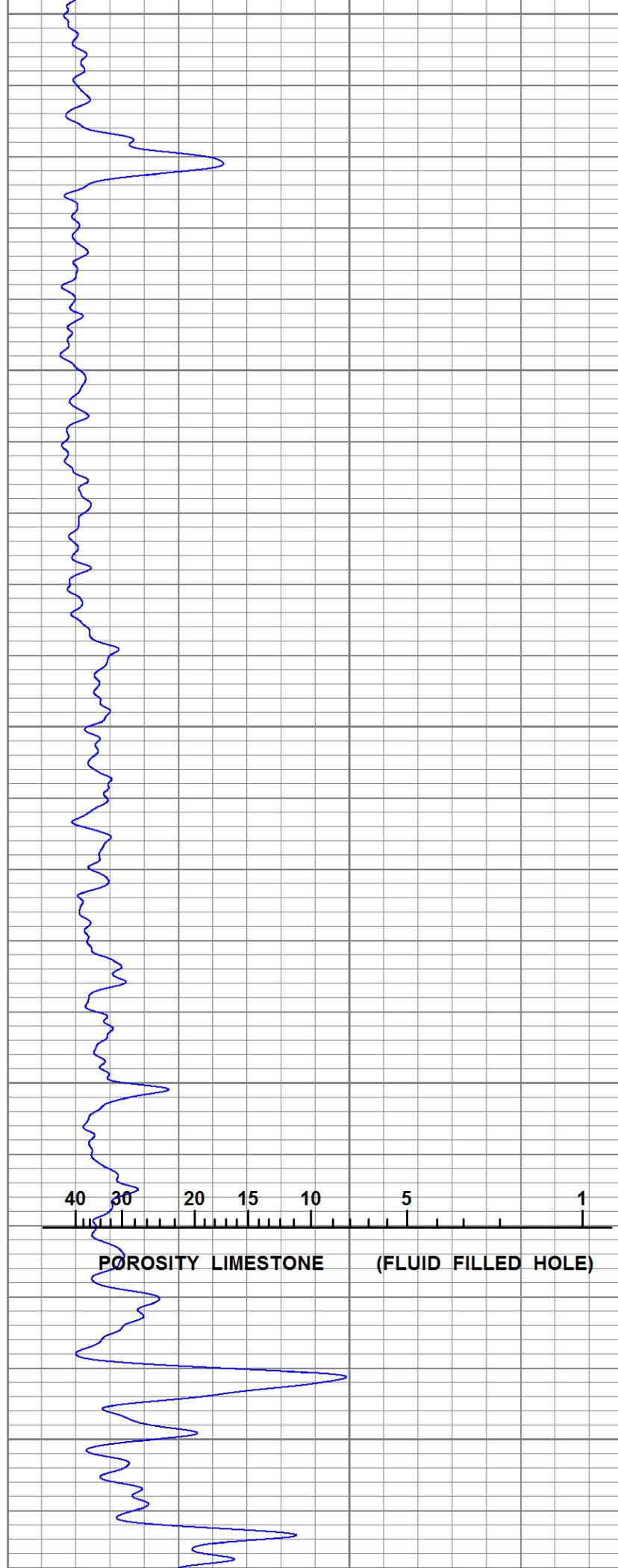
1

POROSITY LIMESTONE

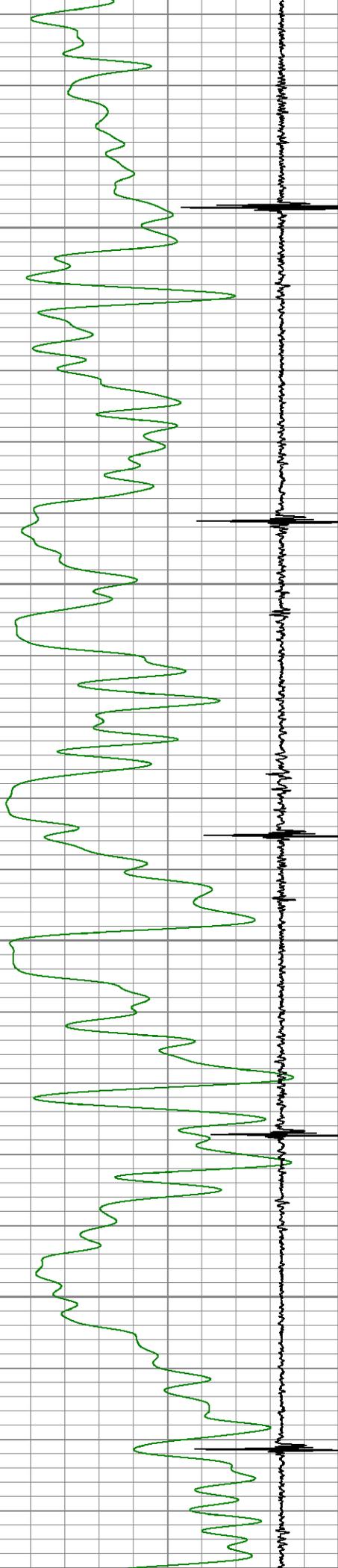
(FLUID FILLED HOLE)



1400  
1450  
1500  
1550  
1600



40 30 20 15 10 5 1  
POROSITY LIMESTONE (FLUID FILLED HOLE)

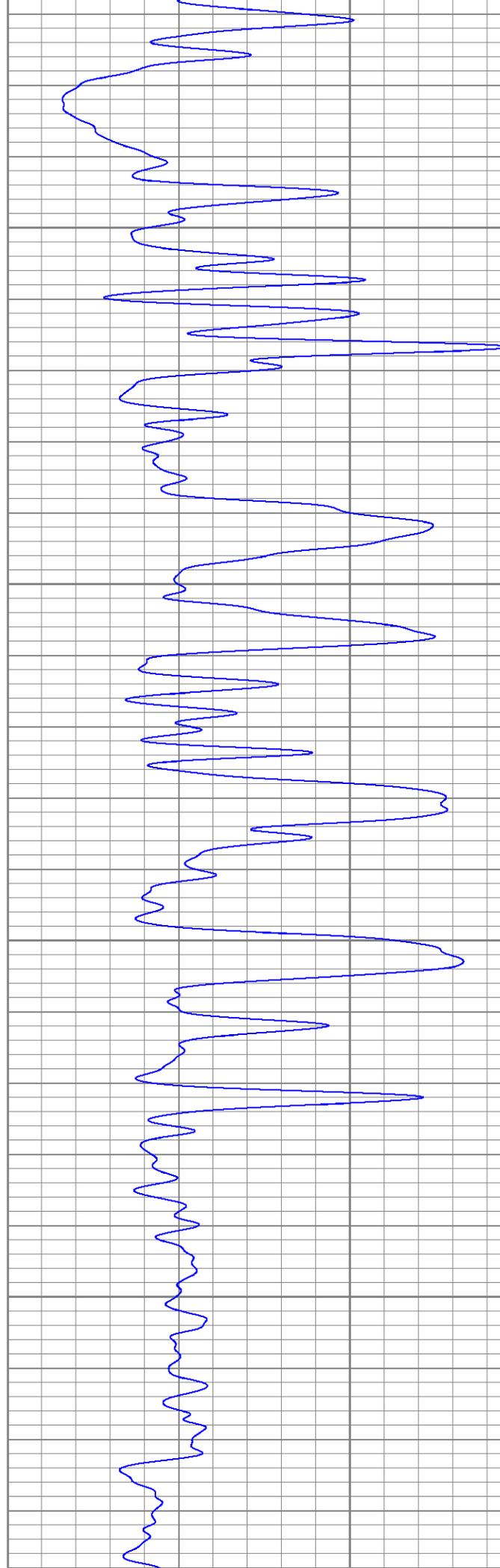


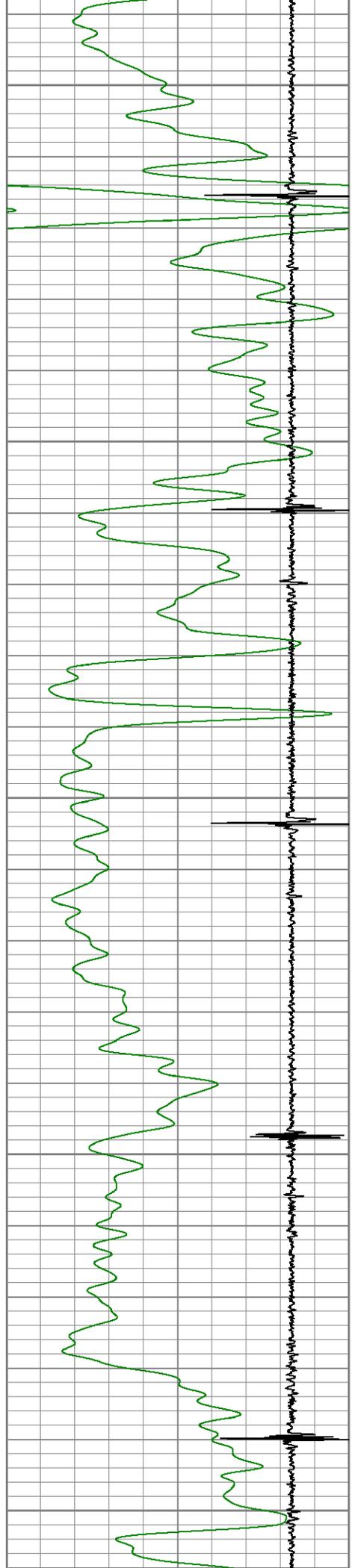
1650

1700

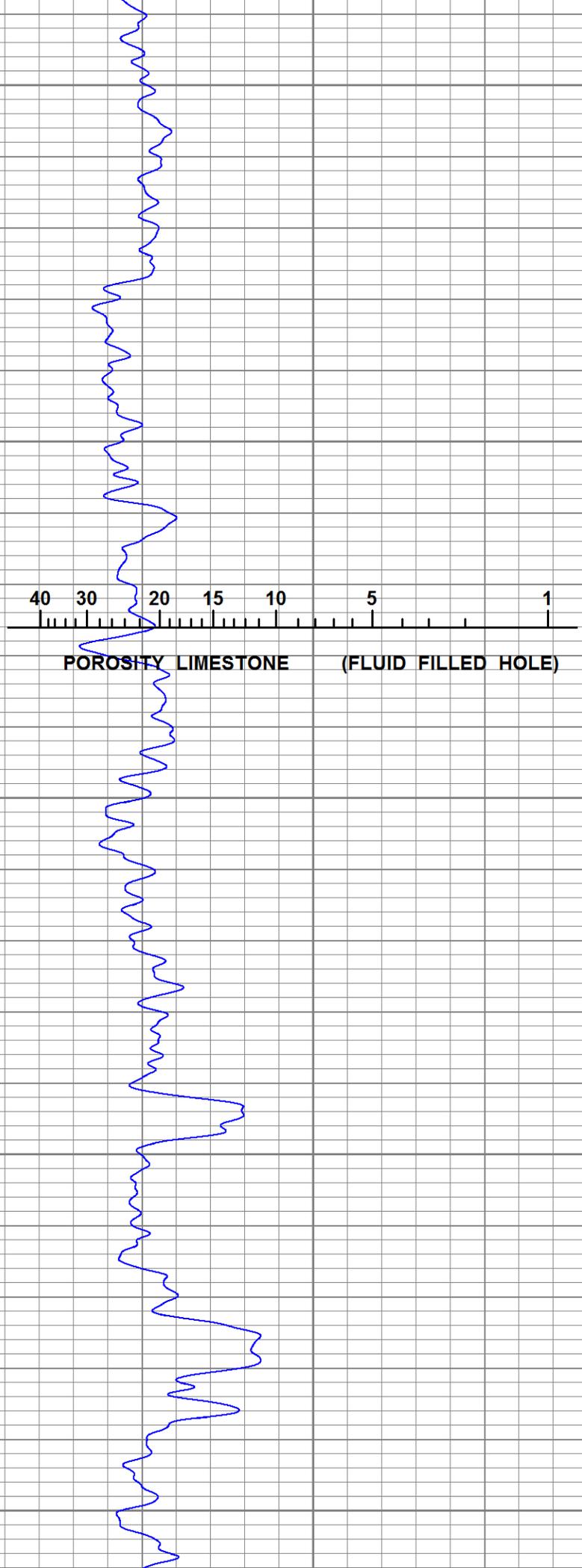
1750

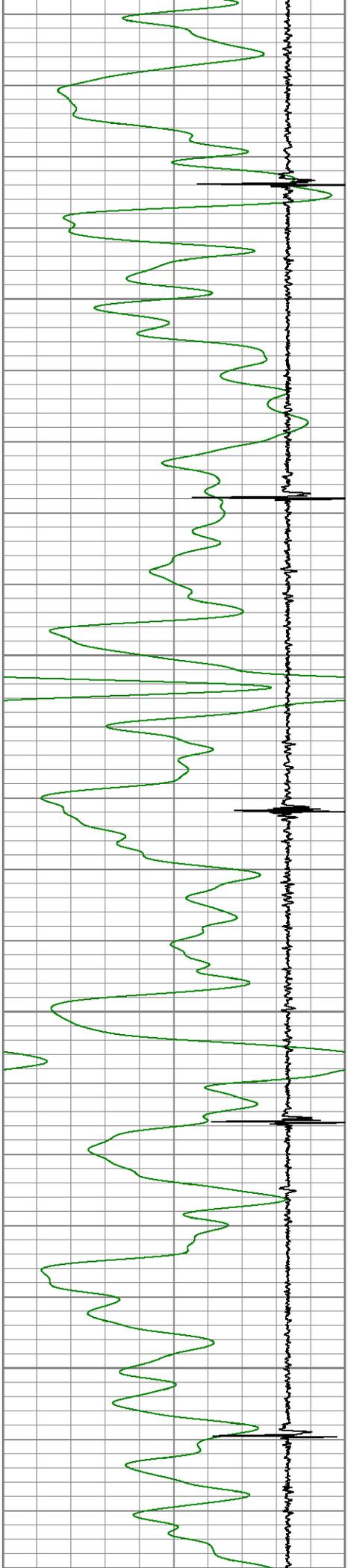
1800





1850  
1900  
1950  
2000  
2050



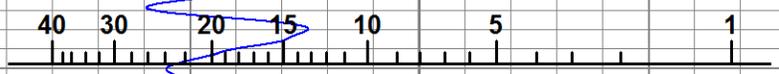
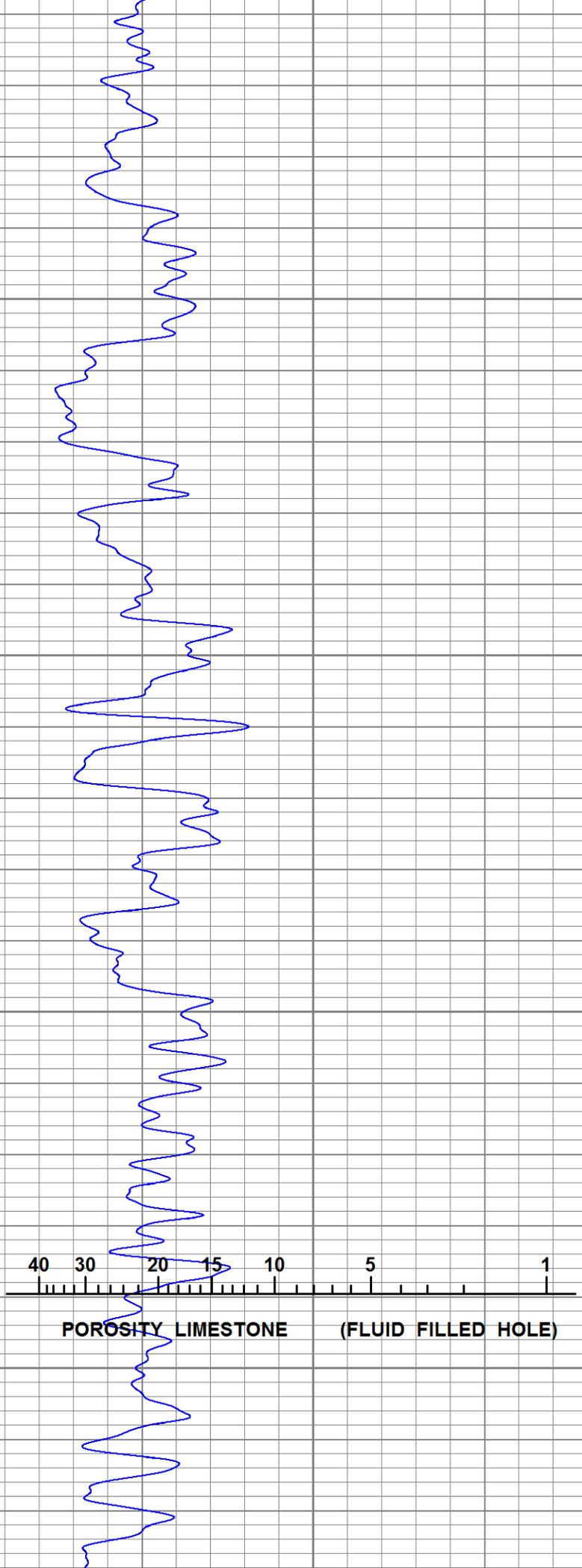


2100

2150

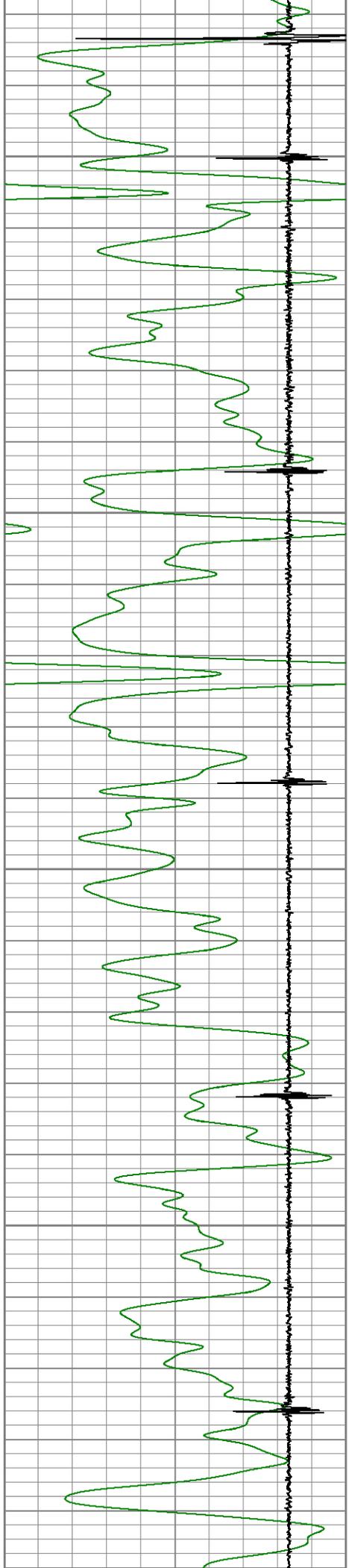
2200

2250



**POROSITY LIMESTONE**

**(FLUID FILLED HOLE)**

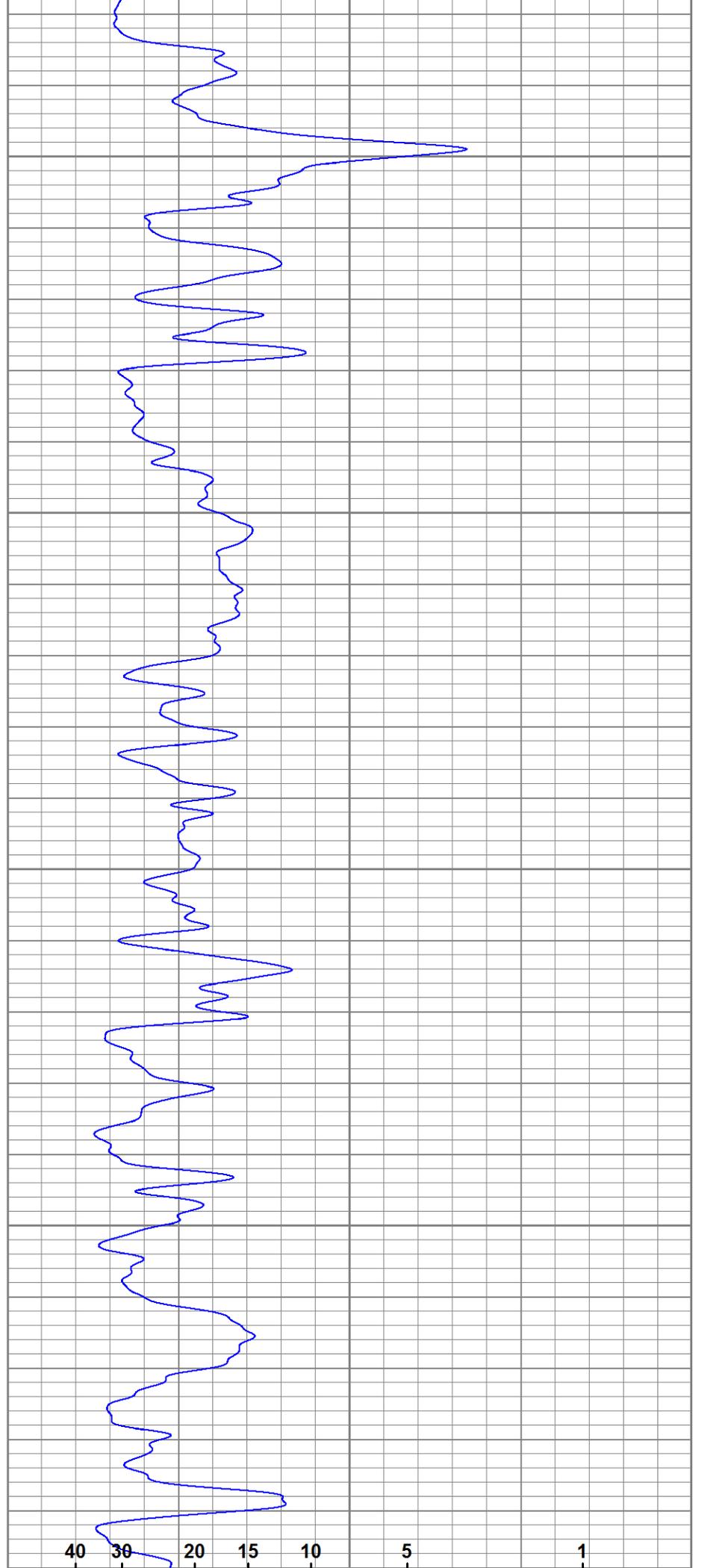


2300

2350

2400

2450



40

30

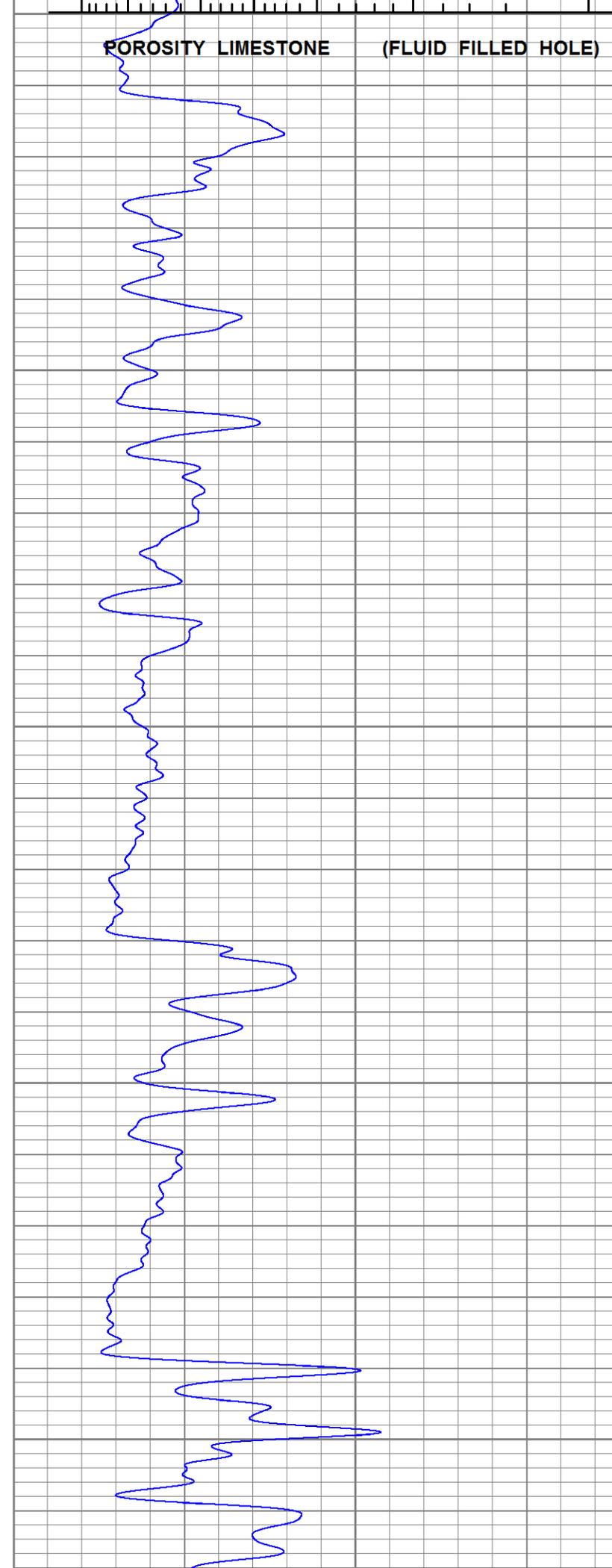
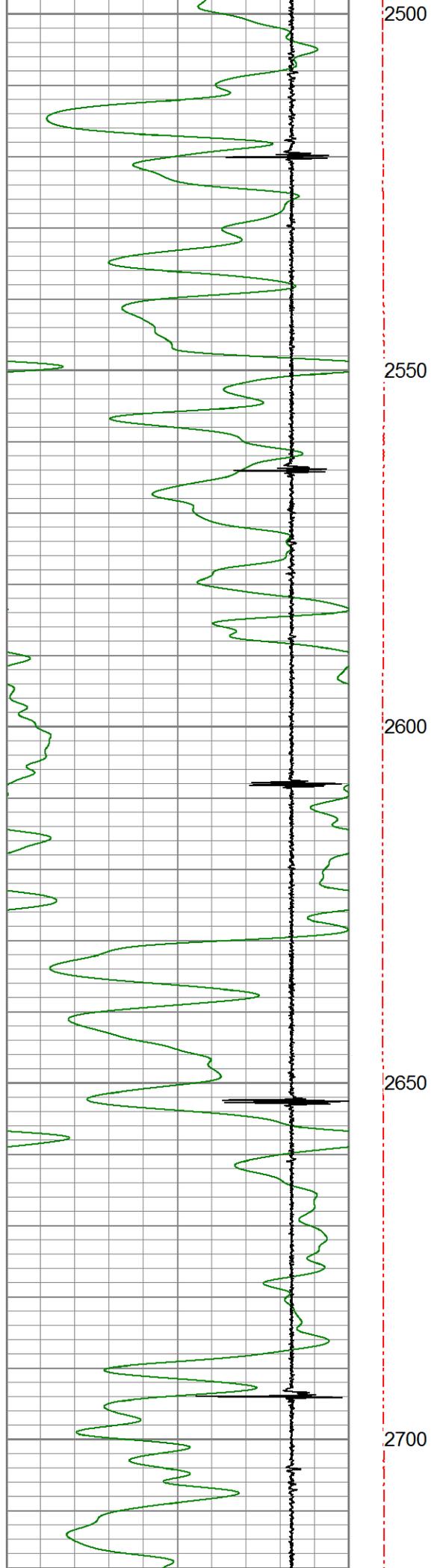
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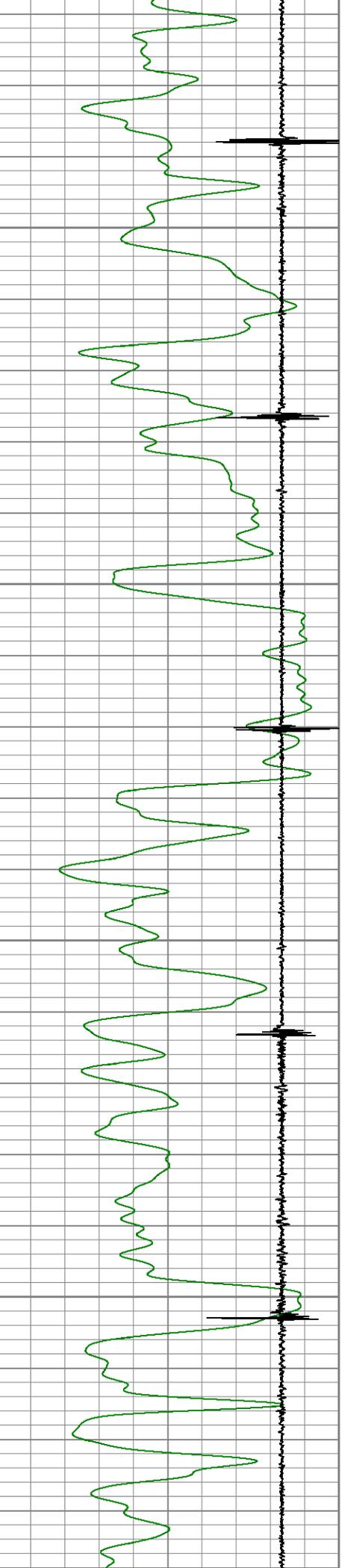
15

10

5

1



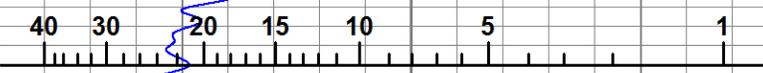


2750

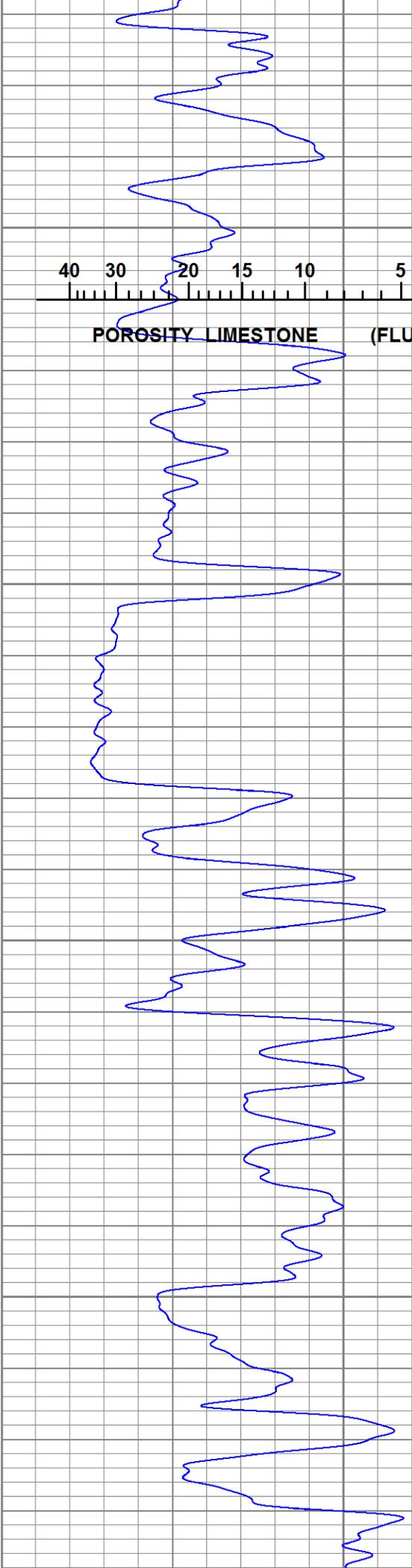
2800

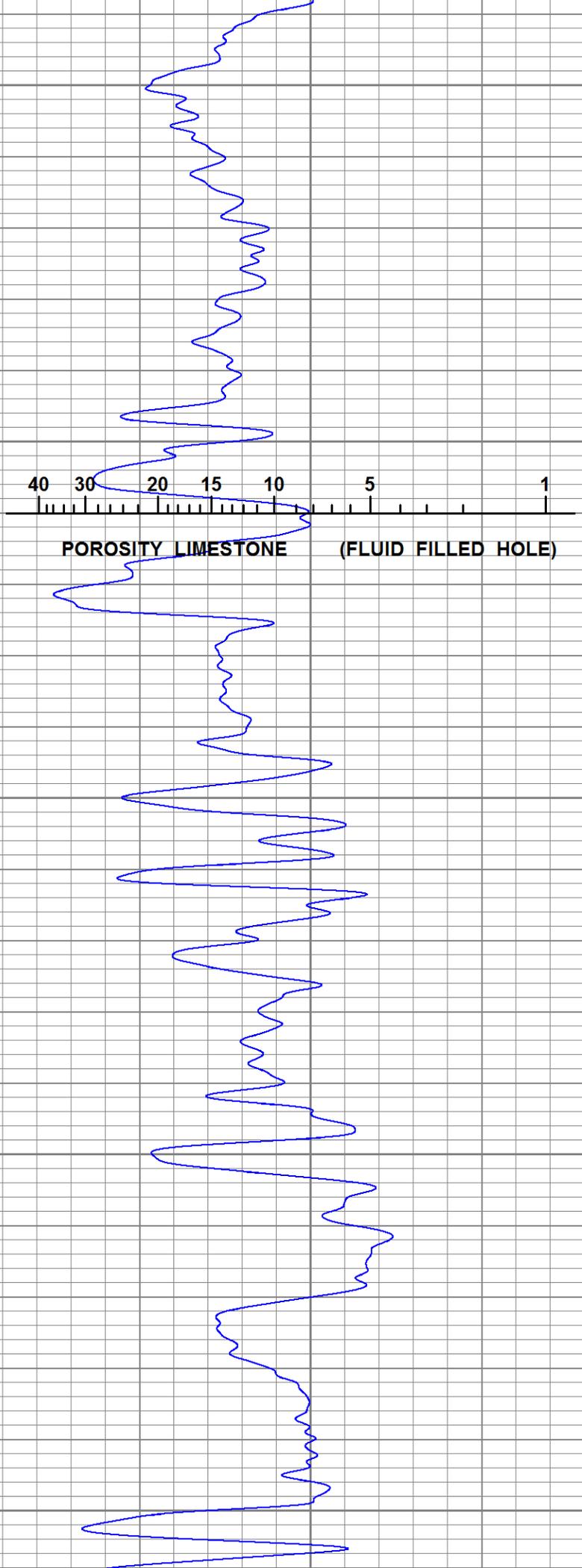
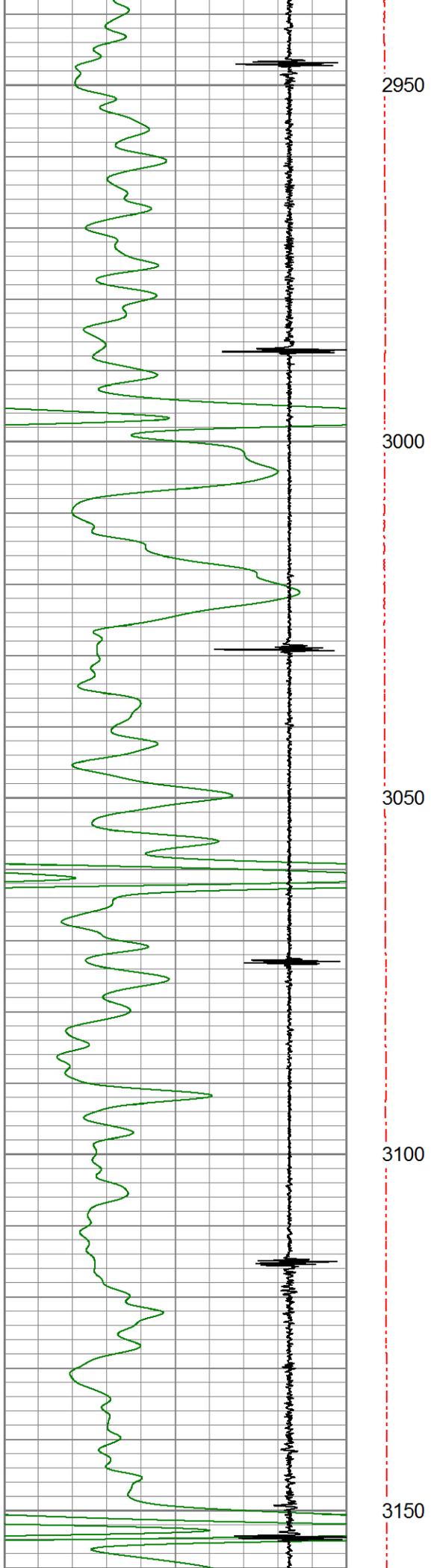
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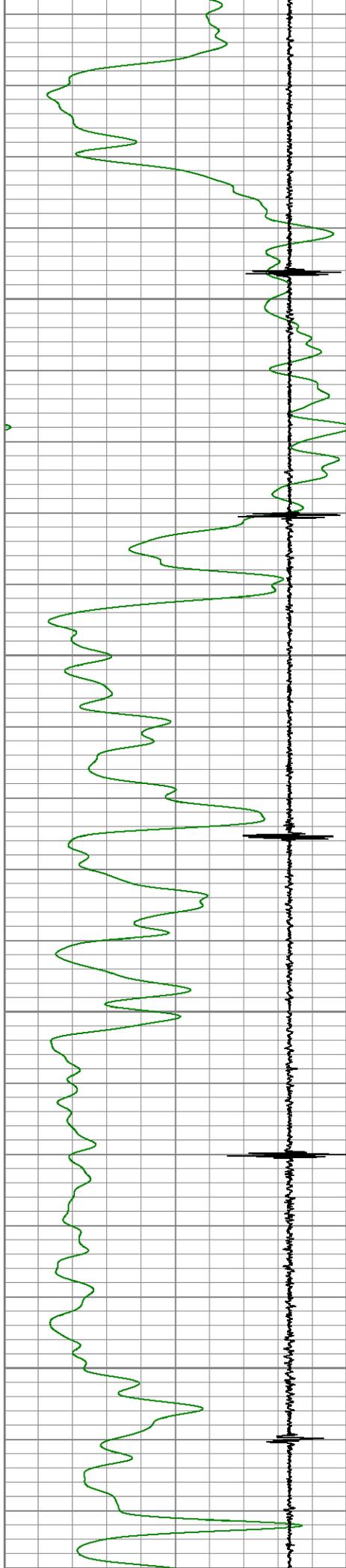
2900



POROSITY LIMESTONE (FLUID FILLED HOLE)





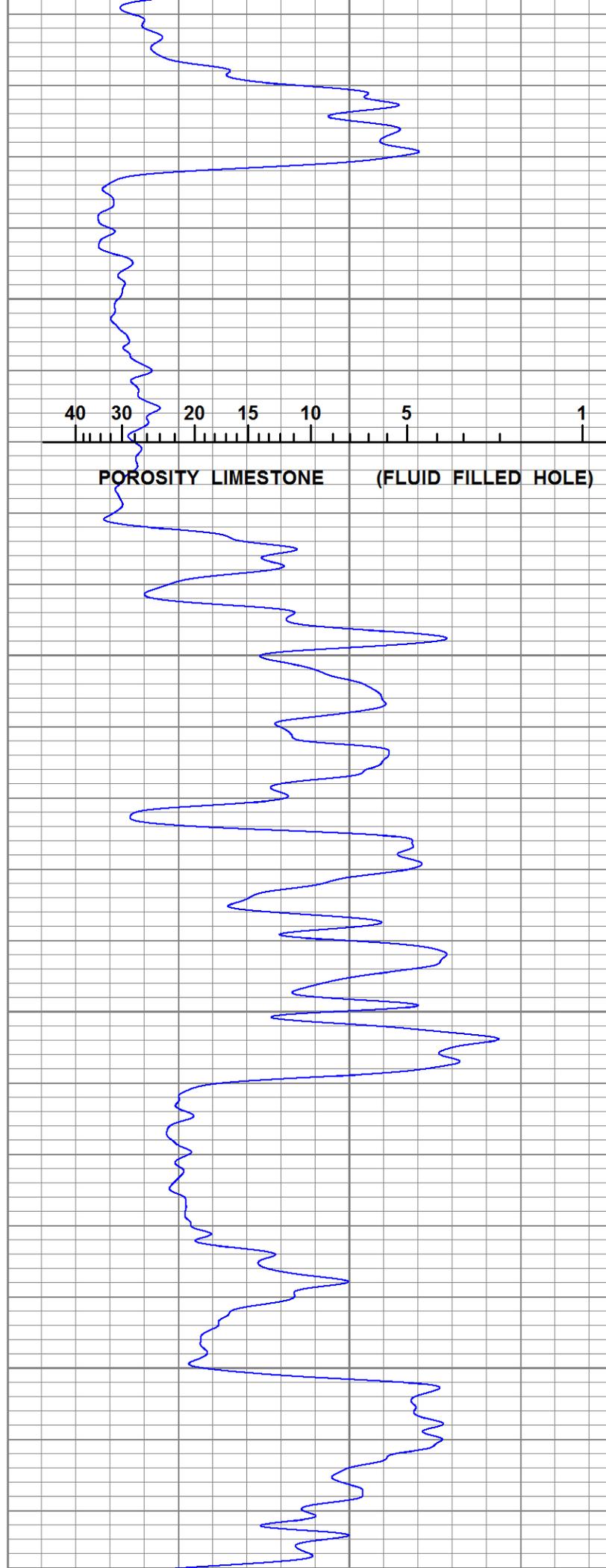


3200

3250

3300

3350



40

30

20

15

10

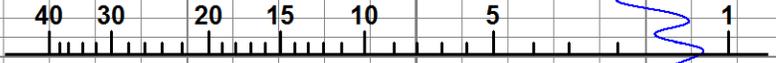
5

1

POROSITY LIMESTONE

(FLUID FILLED HOLE)

3400



**POROSITY LIMESTONE (FLUID FILLED HOLE)**

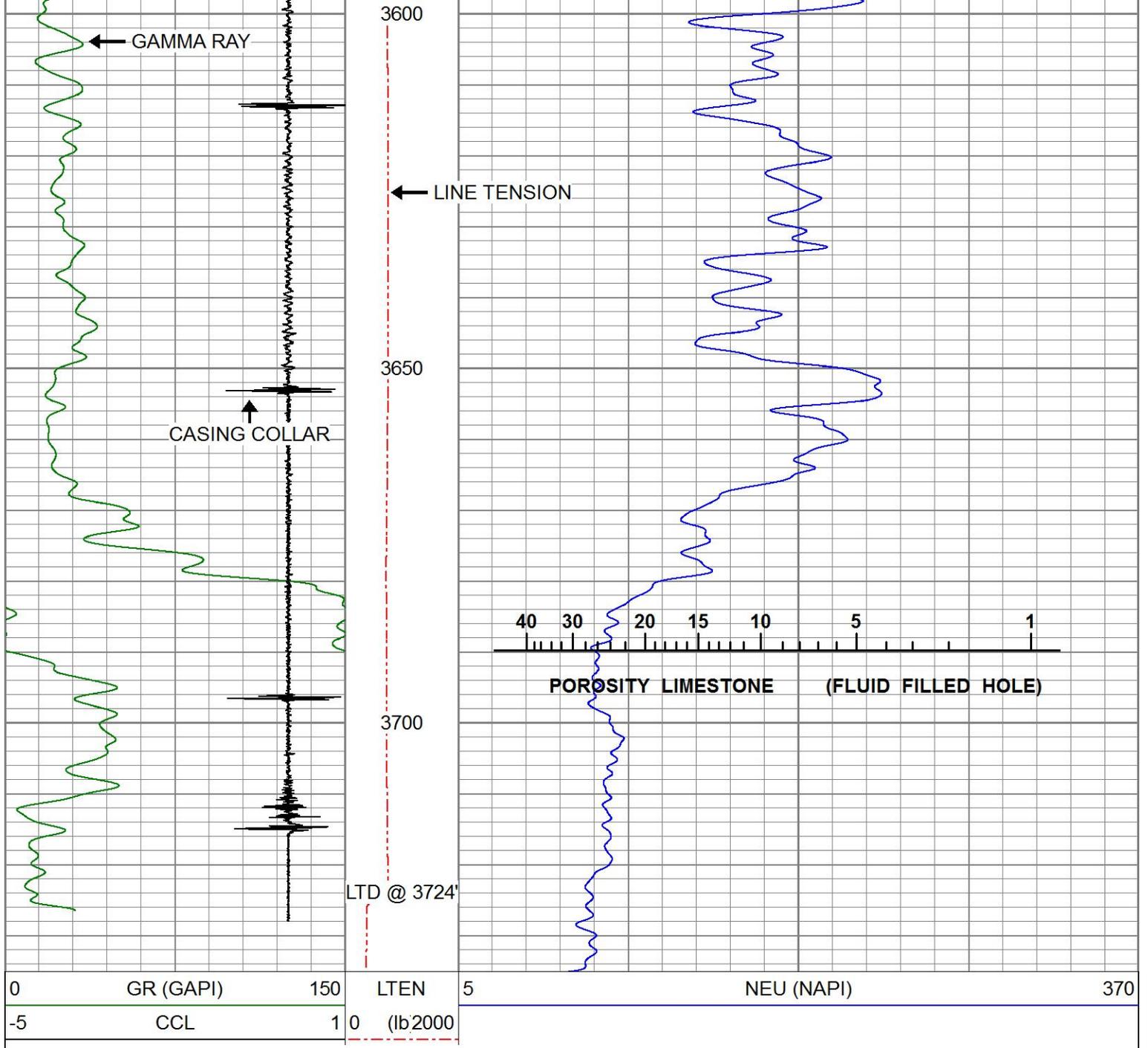
3450



**POROSITY LIMESTONE (FLUID FILLED HOLE)**

3500

3550

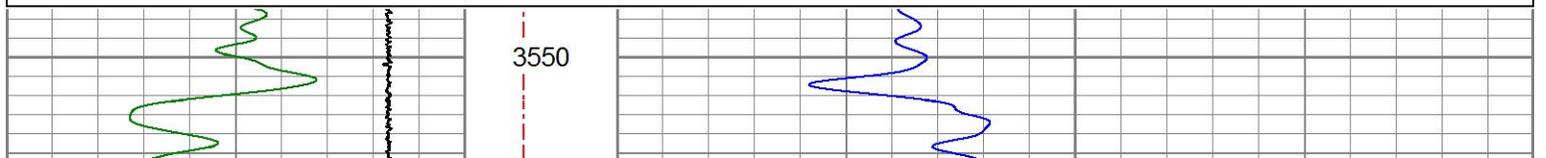


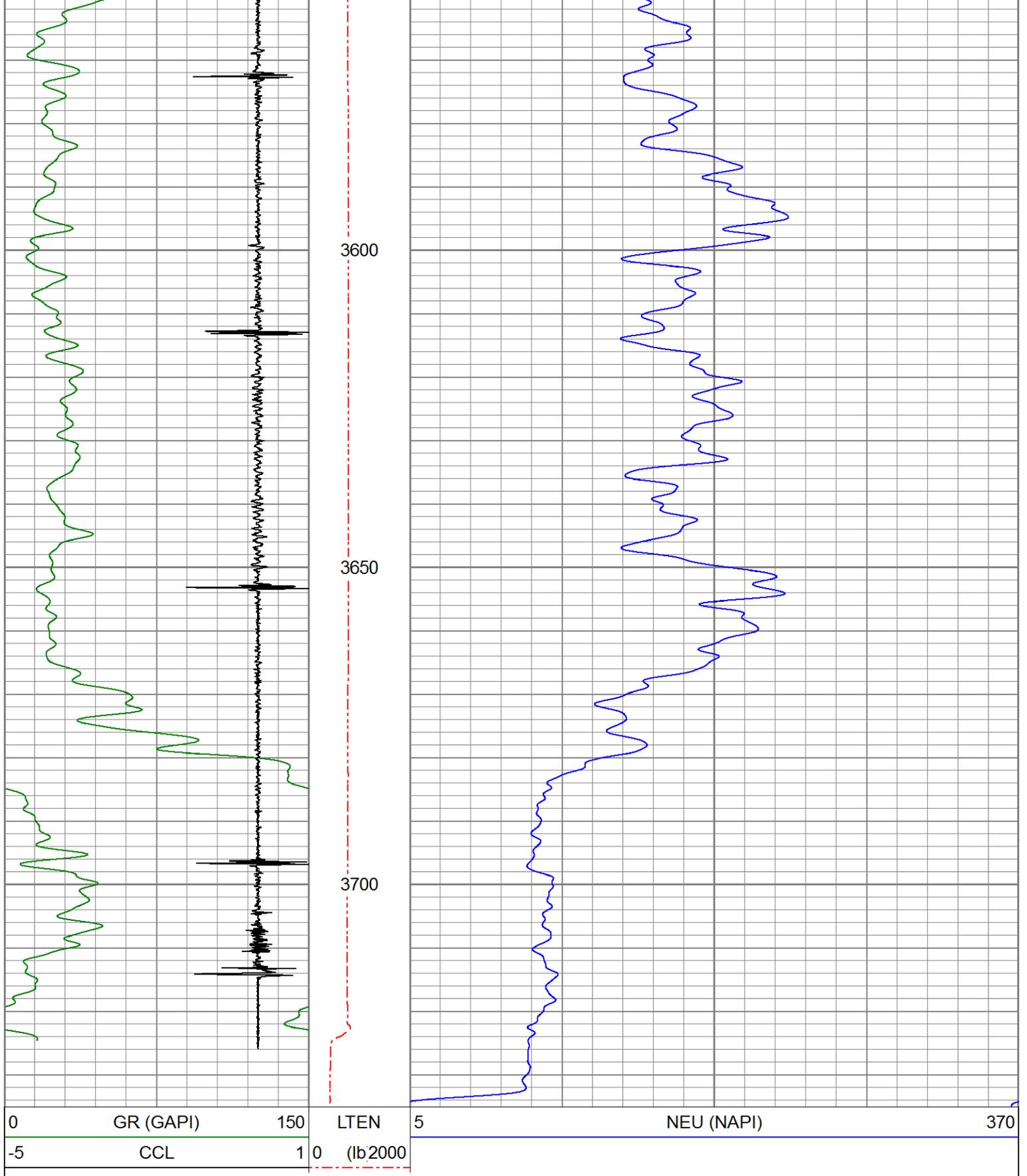

## REPEAT SECTION

ZERO PSI APPLIED AT SURFACE

Database File: fghall\_kruckenberg.db  
 Dataset Pathname: scbl/pass5  
 Presentation Format: PINR\_G~4  
 Dataset Creation: Tue Aug 21 09:53:43 2018  
 Charted by: Depth in Feet scaled 1:240

0	GR (GAPI)	150	LTEN	5	NEU (NAPI)	370
-5	CCL	1	0 (lb2000)			





Calibration Report

Database File fghall\_kruckenbergl.db  
 Dataset Pathname scbl/pass6  
 Dataset Creation Tue Aug 21 10:02:32 2018

Neutron Calibration Report

Serial Number: ProbeNEU1  
 Tool Model: PRNEU1

Tool Model:	PRNEU	(Not Performed)
Performed:		
Calibrator Value:	1	NAPI
Calibrator Reading:	1	cps
Sensitivity:	1	NAPI/cps

Gamma Ray Calibration Report

Serial Number:	Probe-275-GR-CCL	
Tool Model:	275 Probe GR-CCL	
Performed:	Tue Aug 21 09:51:19 2018	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	1.1000	GAPI/cps

Segmented Cement Bond Log Calibration Report

Serial Number:	PROBE-RBL-DCT	
Tool Model:	RBL-DCT	
Calibration Casing Diameter:	5.500	in
Calibration Depth:	2551.272	ft

Master Calibration, performed Tue Aug 21 09:46:25 2018:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.003	1.982	0.000	71.921	36.342	-0.100
CAL	0.003	2.178				
5'	0.003	1.923	0.000	71.921	37.462	-0.110
SUM						
S1	0.037	1.871	0.000	100.000	54.512	-1.996
S2	0.011	1.919	0.000	100.000	52.416	-0.590
S3	0.011	1.999	0.000	100.000	50.307	-0.577
S4	0.014	2.031	0.000	100.000	49.576	-0.671
S5	0.014	2.034	0.000	100.000	49.507	-0.714
S6	0.019	2.061	0.000	100.000	48.977	-0.945
S7	0.010	2.032	0.000	100.000	49.451	-0.505
S8	0.007	1.894	0.000	100.000	52.996	-0.362

Air Zero Calibration, performed Tue Aug 21 09:17:27 2018:

	Raw (v)		Calibrated (v)		Results	
	Zero		Zero		Offset	
3'	0.000		0.000			0.000
5'	0.000		0.000			0.000
SUM						
S1	0.000		0.000			0.000
S2	0.000		0.000			0.000
S3	0.000		0.000			0.000
S4	0.000		0.000			0.000
S5	0.000		0.000			0.000
S6	0.000		0.000			0.000
S7	0.000		0.000			0.000
S8	0.000		0.000			0.000

Temperature Calibration Report

Serial Number: PROBE-RBL-DCT  
Tool Model: RBL-DCT  
Performed: (Not Performed)

	Reference	Reading
Low Reference:	0.00 degF	0.00 degF
High Reference:	1.00 degF	1.00 degF
Gain:	1.00	
Offset:	0.00	
Delta Spacing	1	



**PIONEER**

Pioneer Energy Services

Company	FG HOLL COMPANY LLC
Well	KRUCKENBERG #1-18
Field	HEIZER WEST
County	BARTON
State	KANSAS