

# STEP

**PHASED INDUCTION**  
**SHALLOW FOCUS SP LOG**

## energy services

**Company:** BEREXCO, LLC.  
**Well:** LEMKE 'A' #3  
**Field:** WAKEENEY  
**Country:** TREGO  
**State:** KANSAS  
**Country:** USA  
**API No.:** 15-195-23101-00-00

**File No.:** HAYS-70631  
**Company:** BEREXCO, LLC.  
**Well:** LEMKE 'A' #3  
**Field:** WAKEENEY  
**Country:** TREGO  
**State:** KANSAS  
**Country:** USA  
**API No.:** 15-195-23101-00-00

**Location:**  
 330' FSL & 1320' FWL  
 S2 S2 SW

**LSD:**                      **Sect:** 15                      **Twp:** 11S                      **Rge:** 23W

<b>Permanent Datum:</b>	GL	<b>Elevations:</b>		<b>Services:</b>	
<b>Drilling Measured From:</b>	KB	KB 2271.00	Ft	CNP	MLT
<b>Log Measured From:</b>	KB	DF 2270.00	Ft	LDP	PIT
<b>Above Permanent Datum:</b>	7.00 Ft	GL 2264.00	Ft	CST	
<b>Date:</b>	03-16-2020				
<b>Run Number</b>	1				
<b>Depth--Driller</b>	4075.0	Ft			
<b>Depth--Logger</b>	4076.0	Ft			
<b>First Reading</b>	4075.0	Ft			
<b>Last Reading</b>	263.0	Ft			
<b>Casing--Driller</b>	263.0	Ft			
<b>Casing--Logger</b>	263.0	Ft			
<b>Bit Size</b>	7.875	In			
<b>Casing Size</b>	8.625	In			
<b>Hole Fluid Type</b>	CHEMICAL				
<b>Density</b>	9.3				
<b>Fluid Loss</b>	7.6				
<b>PH/Viscosity</b>	9.5		50.0		
<b>Sample Source</b>	MEASURED				
<b>RM@Measured Temp.</b>	1.000	@ 79 F			
<b>RMF@Measured Temp</b>	0.850	@ 79 F			
<b>RMG@Measured Temp.</b>	1.150	@ 79 F			
<b>Source RMF/RMC</b>	CALCULATED/CALCULATED				
<b>RM@BHT</b>	0.680 @ 123 F				
<b>Time Circulation Stopped</b>	03-16-2020 12:00				
<b>Max Recorded Temp.</b>	123		F		
<b>Equipment/Base</b>	TRK137		HAYS		
<b>Recorded By</b>	B.BAILEY				
<b>Witnessed By</b>	JERRY SMITH				

The customer is hereby warned that by providing the log data herein, STEP Energy Services does not agree to provide any interpretation of log data, conversion of log data to physical rock parameters or recommendations. STEP Energy Services does not guarantee or warrant either expressly or impliedly, the accuracy of any interpretation of log data, conversion of log data to physical rock parameters or recommendations which may be given by STEP Energy Services personnel. Any interpretation, conversion or recommendation is not part of the consideration for the agreement between the parties and is not part of any part of the charge by STEP Energy Services for its services. Any user of the log data is warned that said user is not entitled to rely on interpretations, conversions or recommendations as aforesaid.

Bitsize Intervals		Casing Strings			
Size (In)	Bottom (Ft)	Size (In)	Weight (Lbs)	Bottom (Ft)	Top (Ft)
7.875	4075.00	8.625	17.00	263.00	0.00

<b>Run Number</b>	1	
<b>Date</b>	03-16-2020	
<b>Date/Time On Bottom</b>	03-16-2020 17:15	
<b>Depth to Fluid</b>	0.0	Ft
<b>Salinity</b>	3000.000	
<b>RMF@BHT</b>	0.680	@ 123 F
<b>RMC@BHT</b>	0.780	@ 123 F

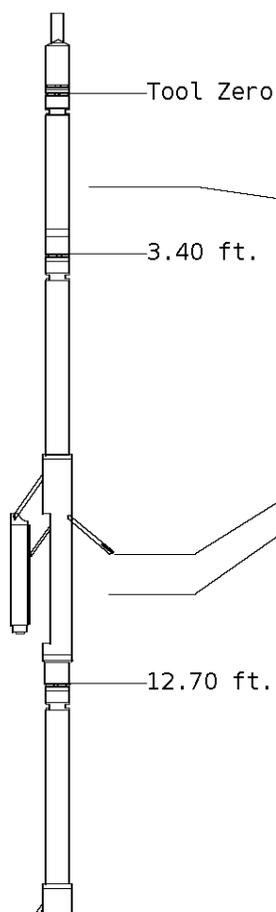
ALL PRESENTATIONS AS PER CUSTOMER REQUEST  
 GRT, CNT, LDT, CST, MLT AND PIT RUN IN COMBINATION  
 CALIPERS ORIENTED ON X-Y AXIS  
 2.71 G/CC USED TO CALCULATE POROSITY  
 ANNULAR HOLE VOLUME CALCULATED USING 5.5" PRODUCTION CASING  
 PHIN IS CALIPER CORRECTED

GRT: GRP  
 CNT: PHIN, CLCNIN,  
 LDT: PORL, LCORN, PECLN, LDENN, PORLLS, CLLDIN  
 CST: PORS, CDTF, TTIPF, TT2PF, TT3PF, TT4PF, ITT  
 MLT: NOR\_RF, INV\_RF, MSCLPIN  
 PIT: ILD, ILM, SPU, SFLAEC, CIRD

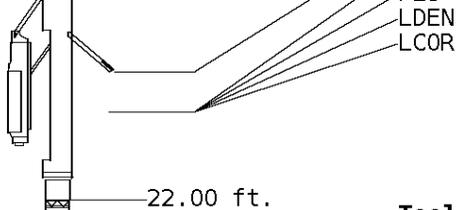
OPERATORS:  
 D. RAGSDALE  
 J. VAUGHN  
 D.LEGLEITER

### Tool String Schematic

**Total Tool Length** - 66.95 ft.  
**Maximum Outside diameter** - 6.00 in.  
**Net Weight in Air** - 1171.00 lbs.



<b>Tool:</b> GRT-B Gamma Ray Controller	<b>Length:</b> 3.40 ft.	<b>O.D.:</b> 3.60 in.		
<b>Sonde ID</b> :GRT-BC-038				
<b>Measure Point</b>	<b>Tool Offset</b>	<b>Stack Offset</b>	<b>Bottom Offset</b>	
GRP	2.00	2.00	64.95	
<b>Tool:</b> CNT-AA Compensated Neutron A Pad on NDT-A	<b>Length:</b> 9.30 ft.	<b>O.D.:</b> 4.36 in.		
<b>Sonde ID</b> :NDT-AF-411				
<b>Source ID</b> :N-1104				
<b>Pad ID</b> :CNP-AE-41				
<b>Measure Point</b>	<b>Tool Offset</b>	<b>Stack Offset</b>	<b>Bottom Offset</b>	
CLCN	6.00	9.40	57.55	
PHIN	6.80	10.20	56.75	
<b>Tool:</b> LDT-DA Litho Density D Pad on NDT-A	<b>Length:</b> 9.30 ft.	<b>O.D.:</b> 4.80 in.		
<b>Sonde ID</b> :NDT-FA-404				
<b>Source ID</b> :1637GW				
<b>Pad ID</b> :LDP-DA-062				
<b>Measure Point</b>	<b>Tool Offset</b>	<b>Stack Offset</b>	<b>Bottom Offset</b>	
CLLD	6.00	18.70	48.25	
PEL	7.00	19.70	47.25	
PES	7.40	20.10	46.85	

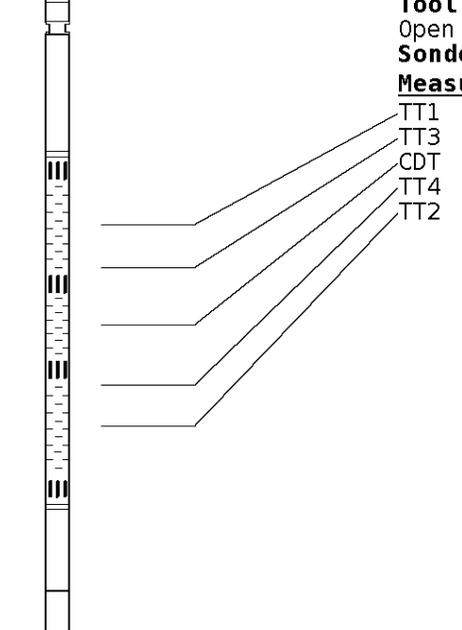


7.20 19.90 47.05  
 7.20 19.90 47.05

22.00 ft.

**Tool:** CST-AD      **Length:** 13.80 ft.   **O.D.** 3.60 in.  
 Open Hole Sonic  
**Sonde ID** :CST-AB-21

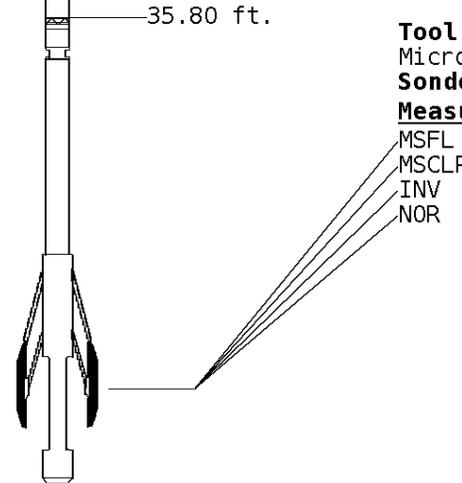
Measure Point	Tool Offset	Stack Offset	Bottom Offset
TT1	4.80	26.80	40.15
TT3	5.80	27.80	39.15
CDT	7.30	29.30	37.65
TT4	8.80	30.80	36.15
TT2	9.80	31.80	35.15



35.80 ft.

**Tool:** MST-DA      **Length:** 9.66 ft.   **O.D.** 6.00 in.  
 Micro Spherically Focused (IC)  
**Sonde ID** :MST-DA-13

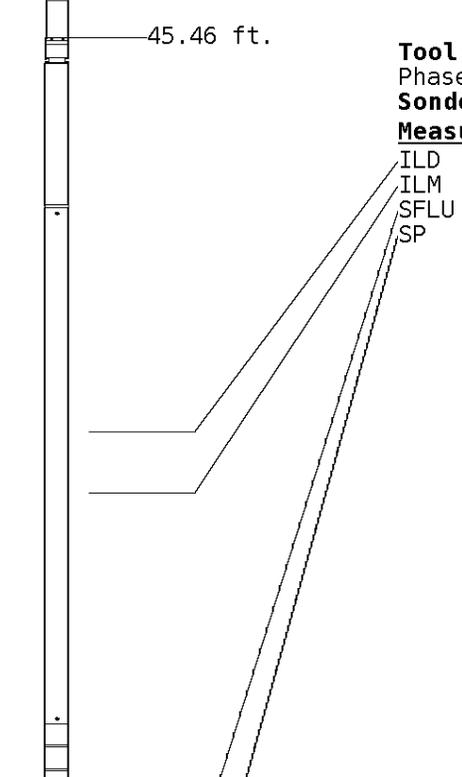
Measure Point	Tool Offset	Stack Offset	Bottom Offset
MSFL	7.60	43.40	23.55
MSCLP	7.60	43.40	23.55
INV	7.60	43.40	23.55
NOR	7.60	43.40	23.55



45.46 ft.

**Tool:** PIT-CA      **Length:** 21.49 ft.   **O.D.** 3.62 in.  
 Phased Dual Induction w/ RM & D  
**Sonde ID** :PIT-AC-043

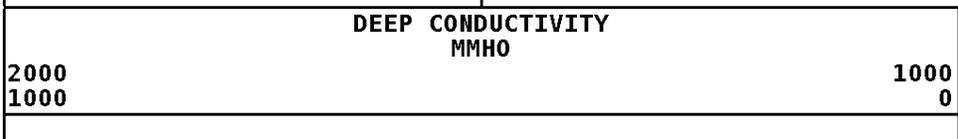
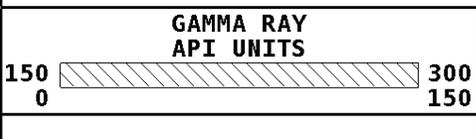
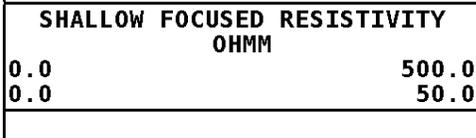
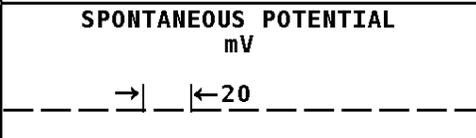
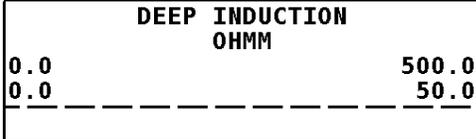
Measure Point	Tool Offset	Stack Offset	Bottom Offset
ILD	8.92	54.38	12.56
ILM	10.10	55.56	11.39
SFLU	17.49	62.95	4.00
SP	20.60	66.06	0.88



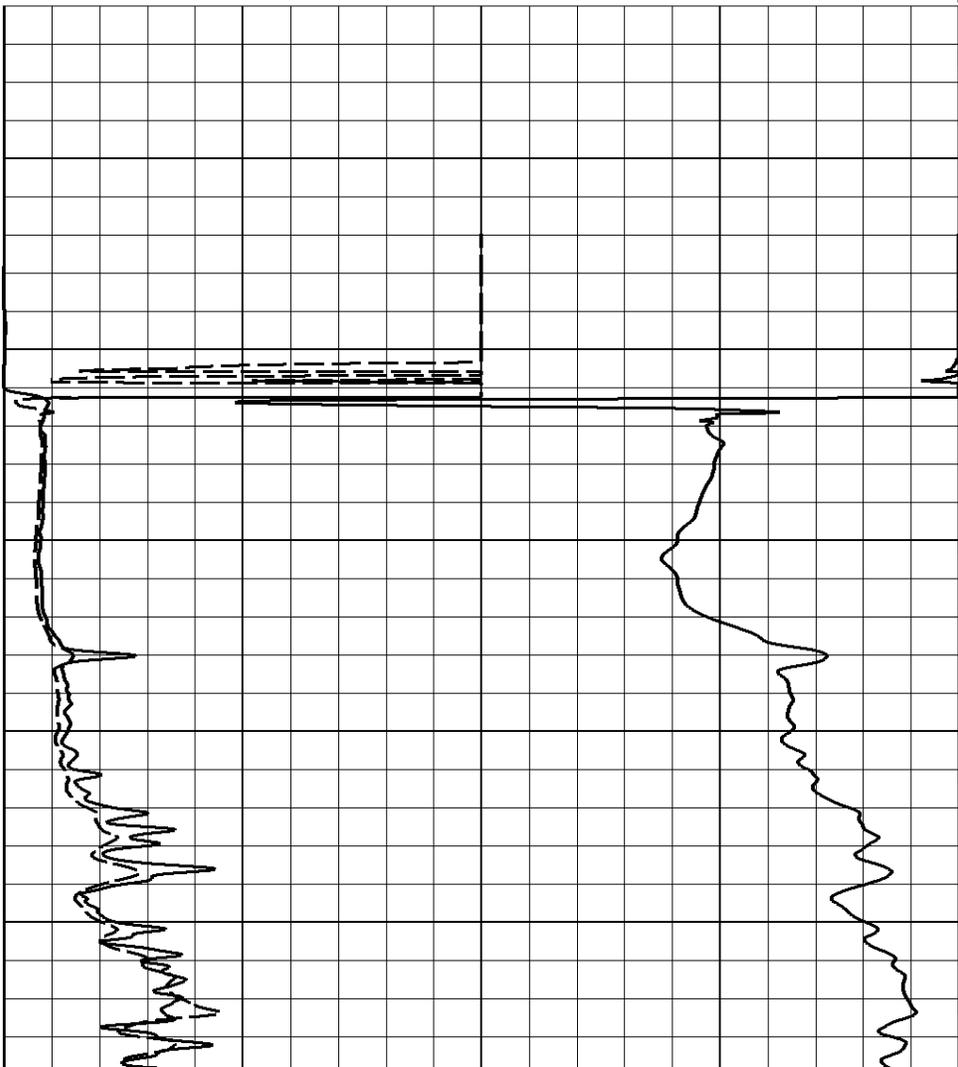
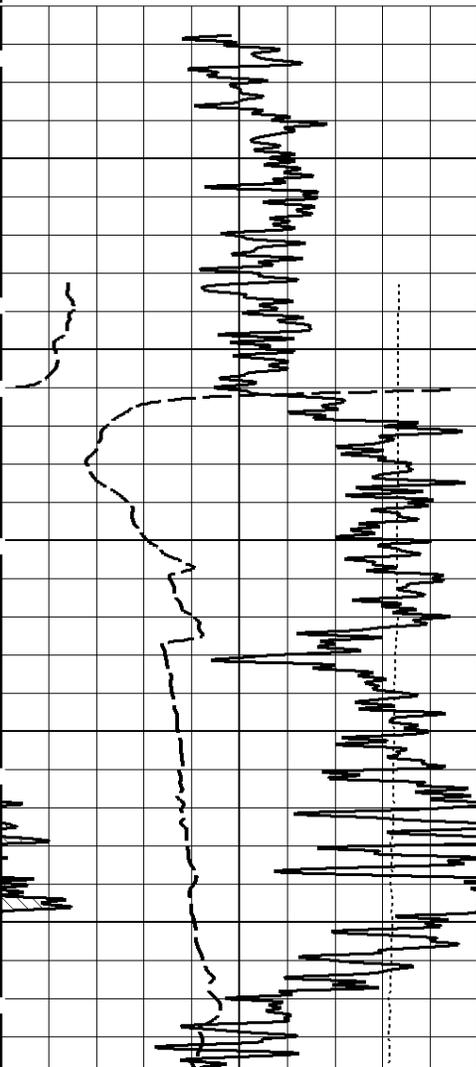
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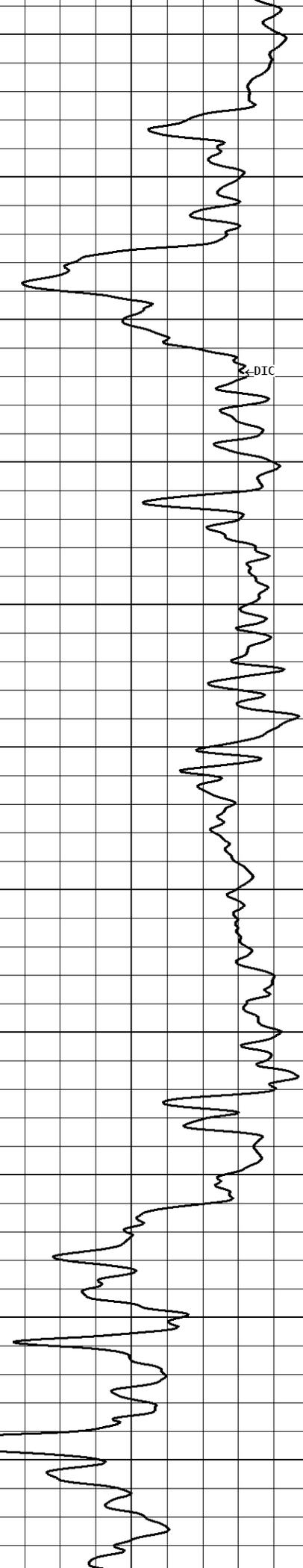
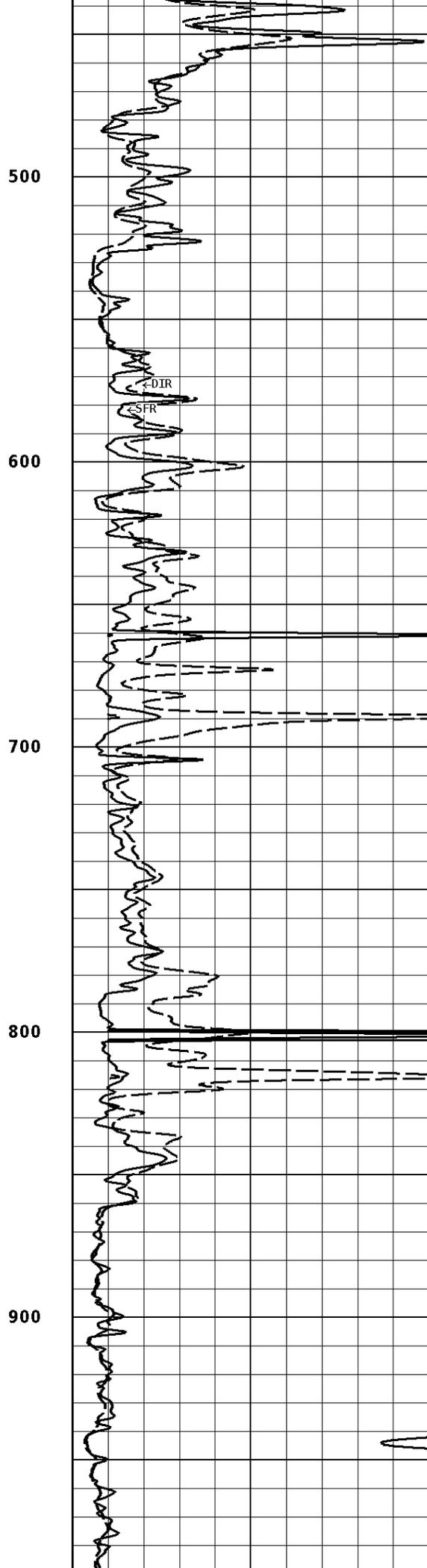
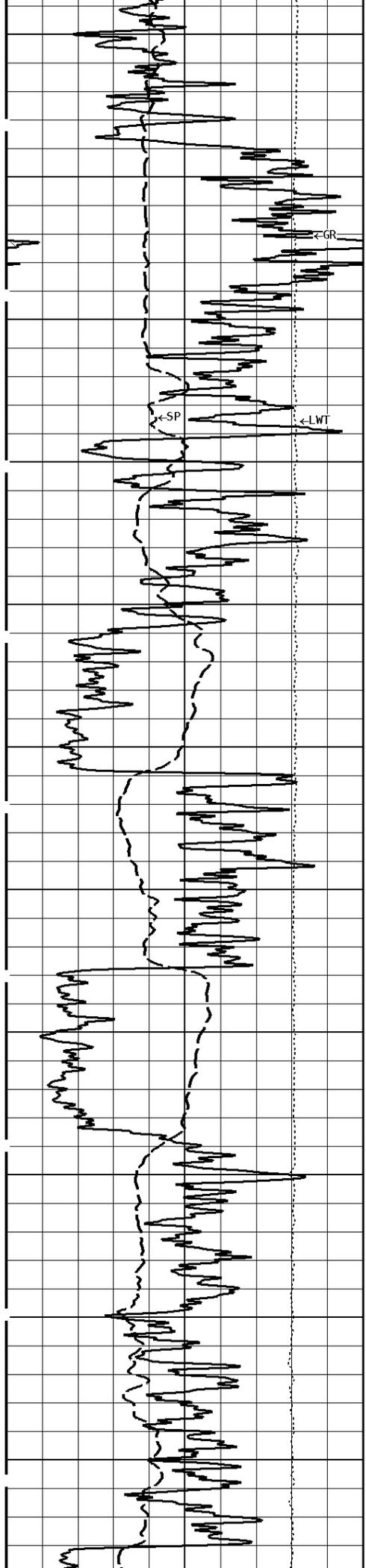
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 Segment: V1.D1.S6 Reprocess MAIN  
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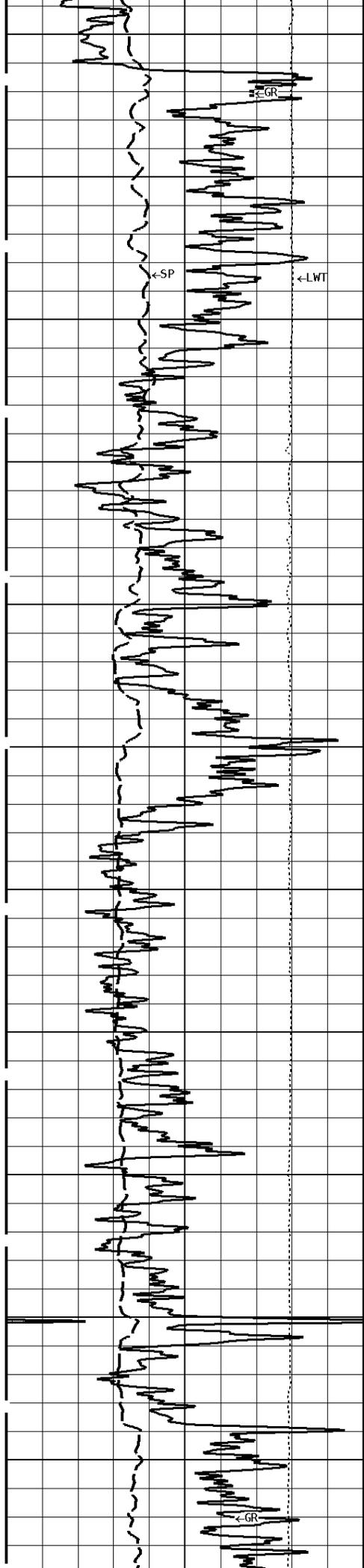
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 Processed: 2020-03/16 19:59 3.4.1-13972



1:600 MAIN SECTION







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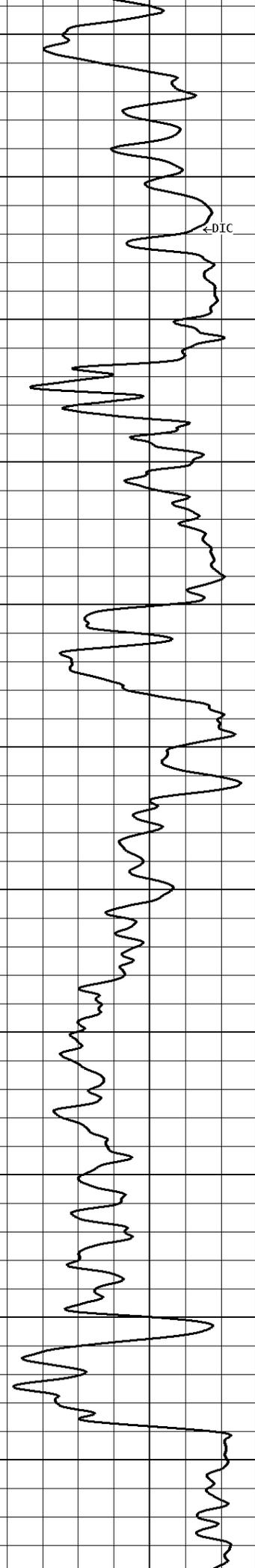
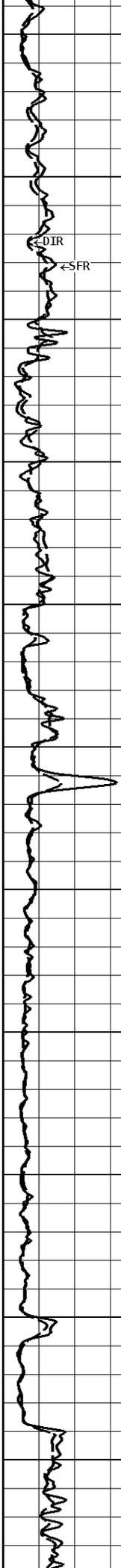
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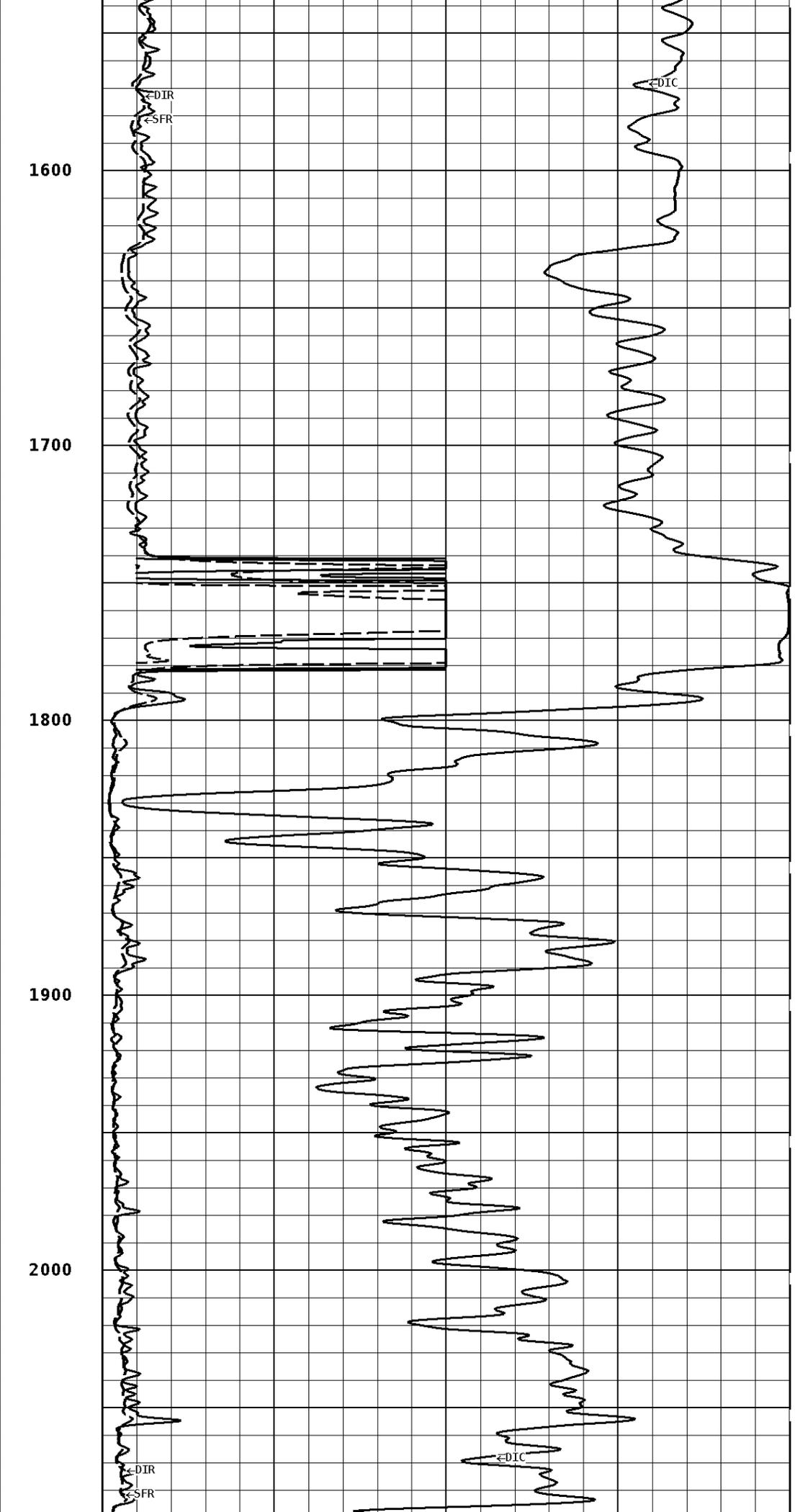
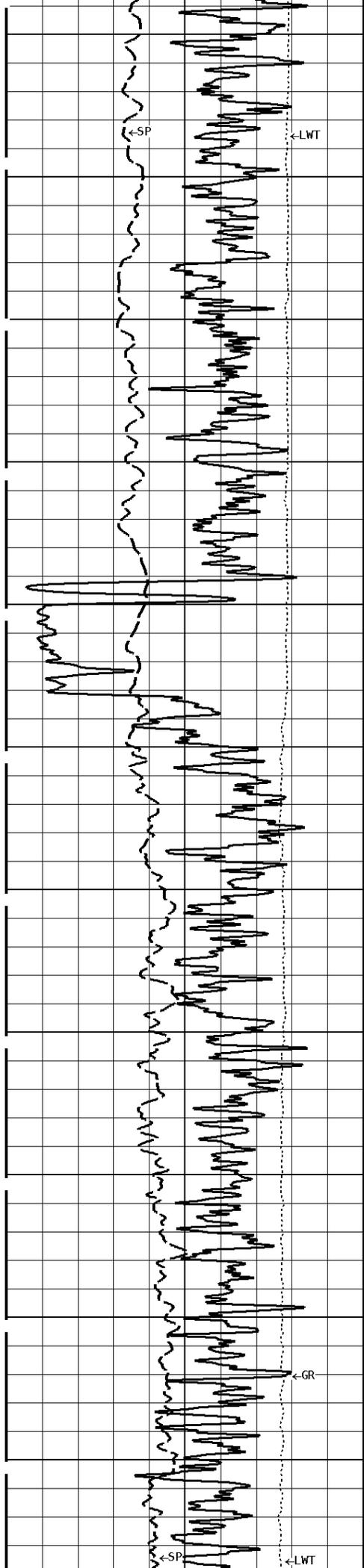
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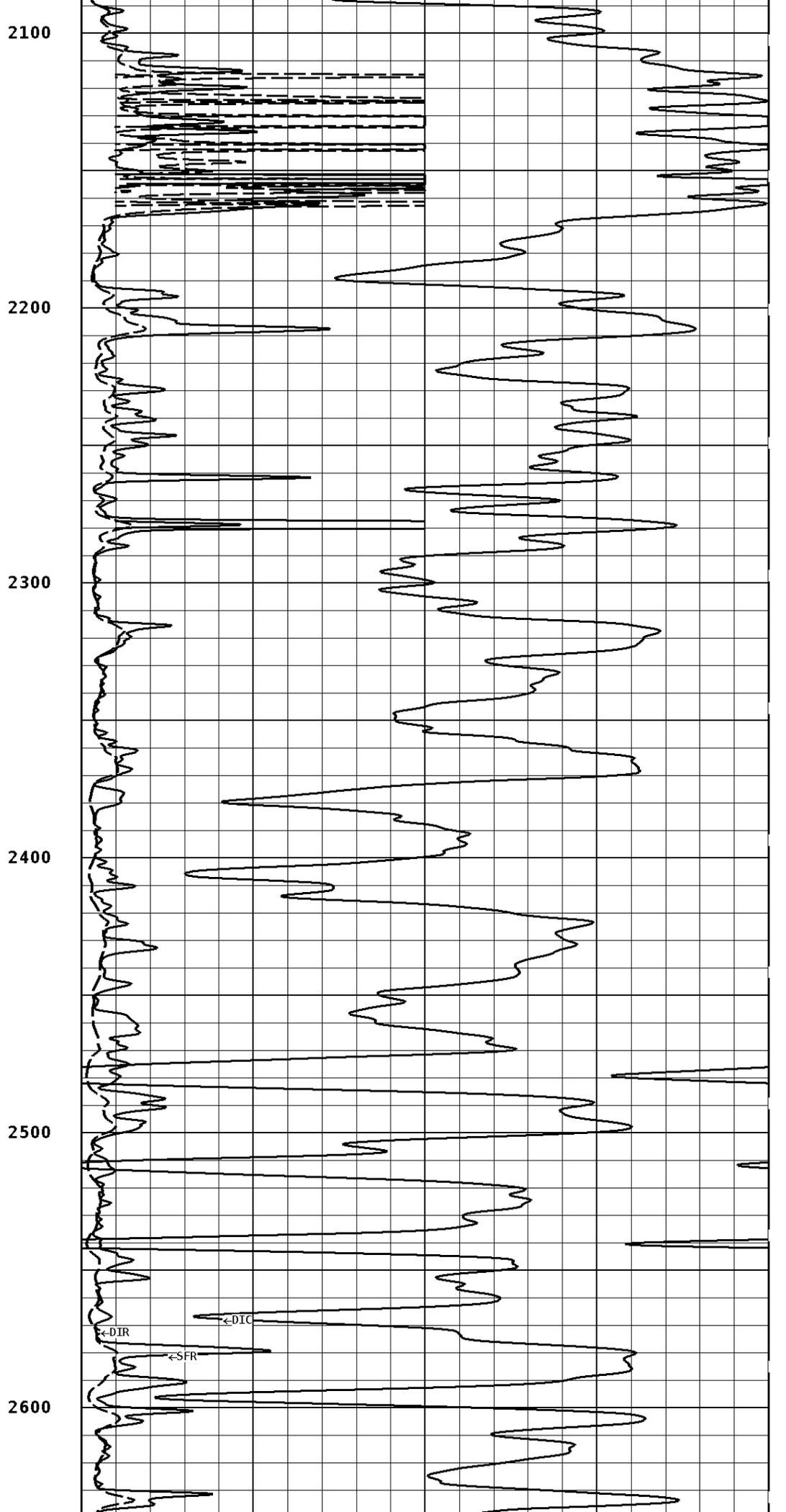
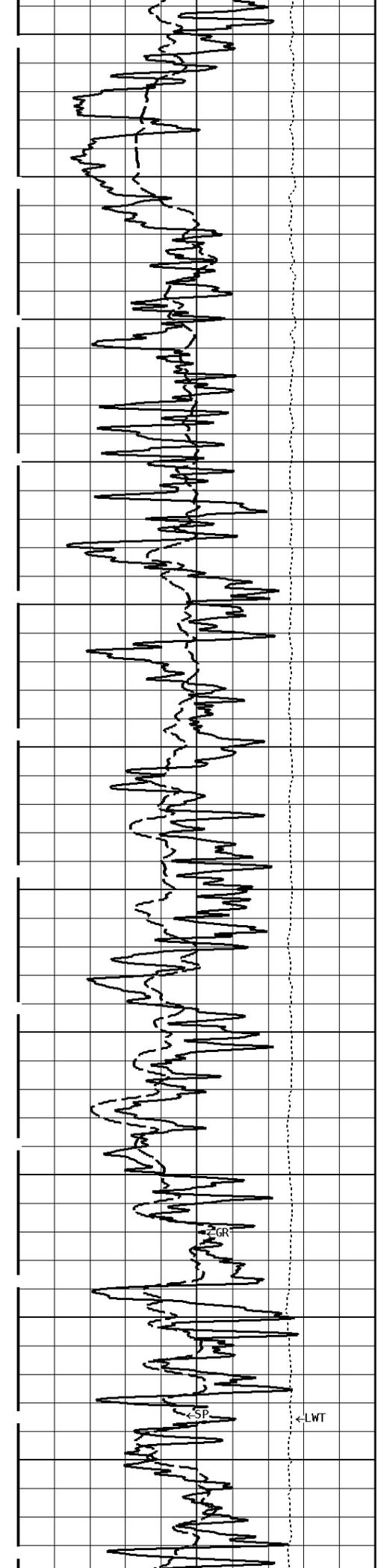
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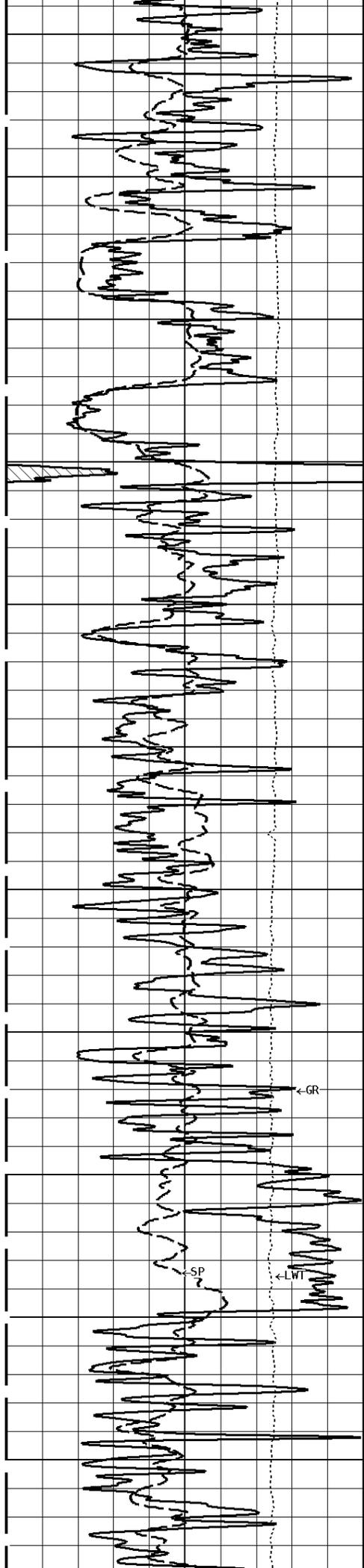
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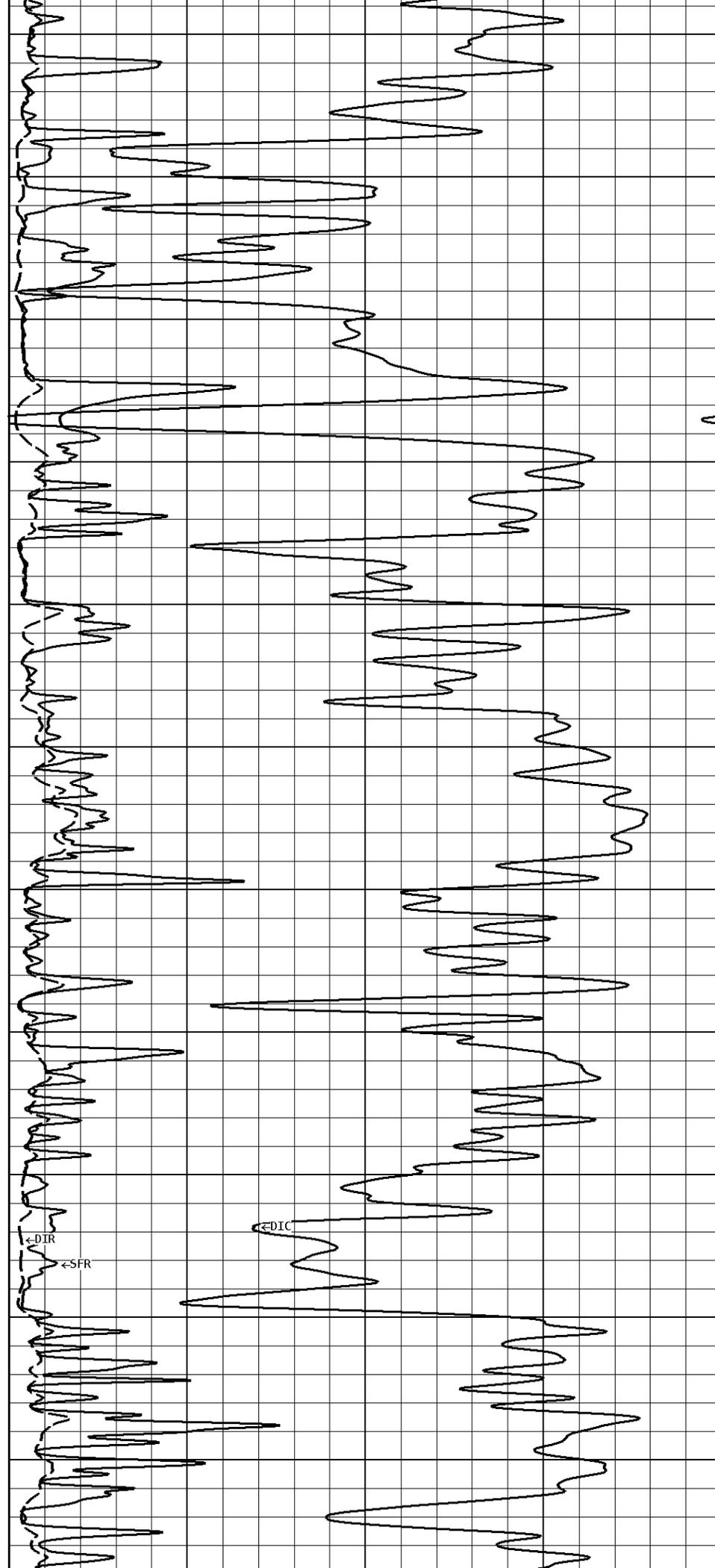
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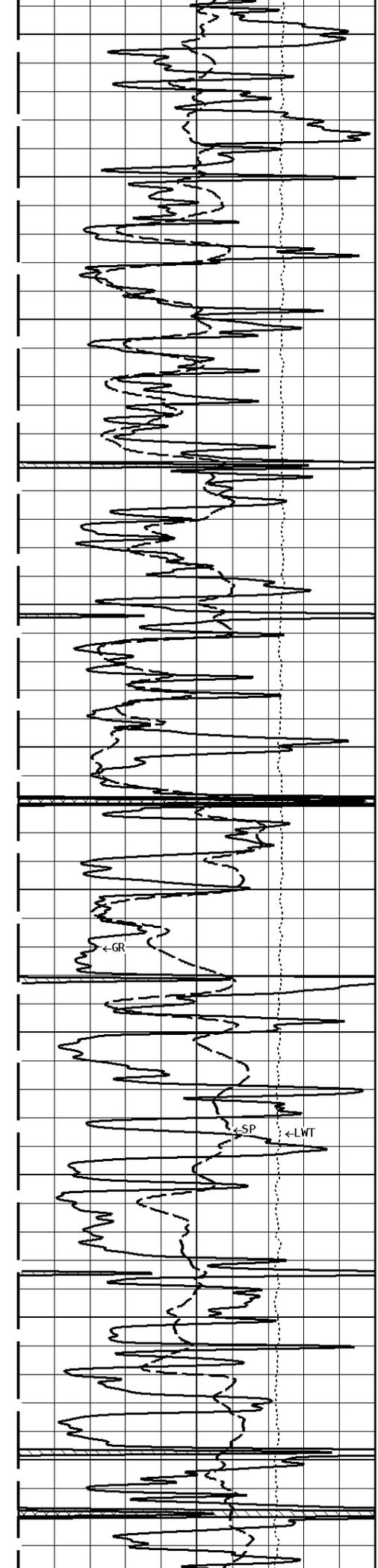
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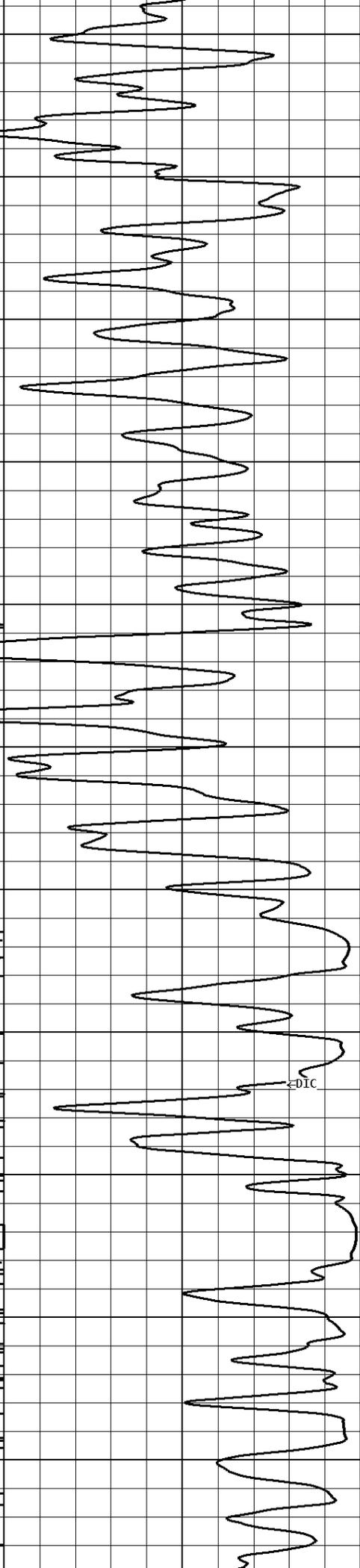
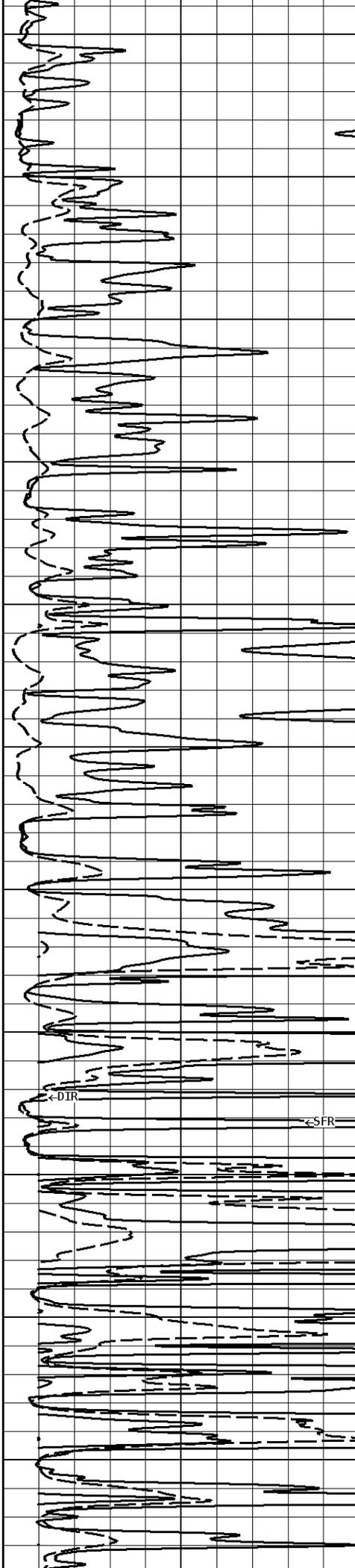
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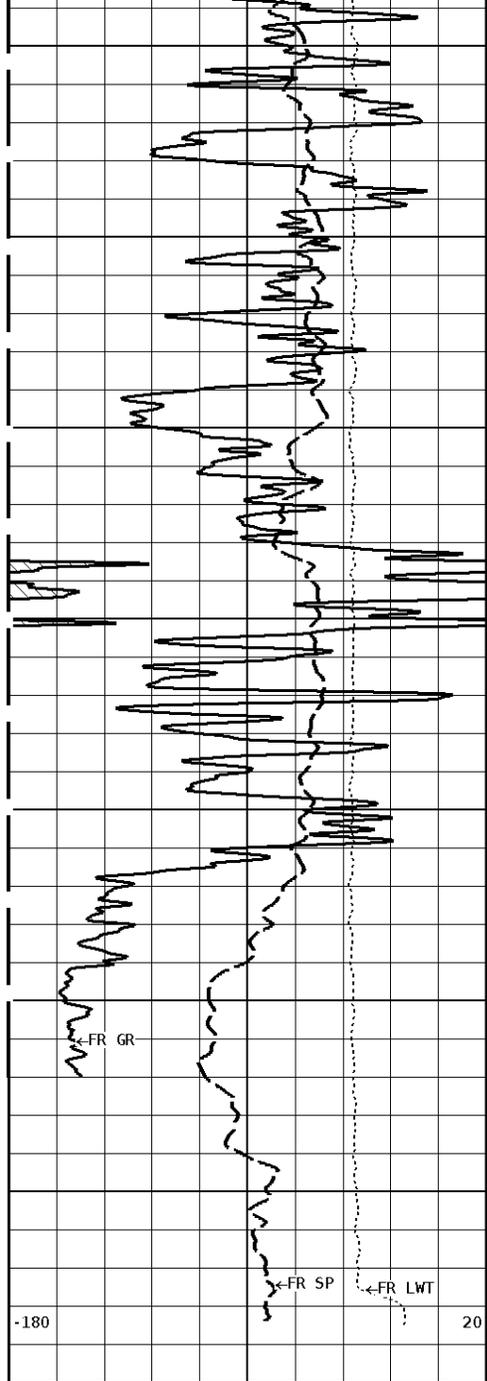
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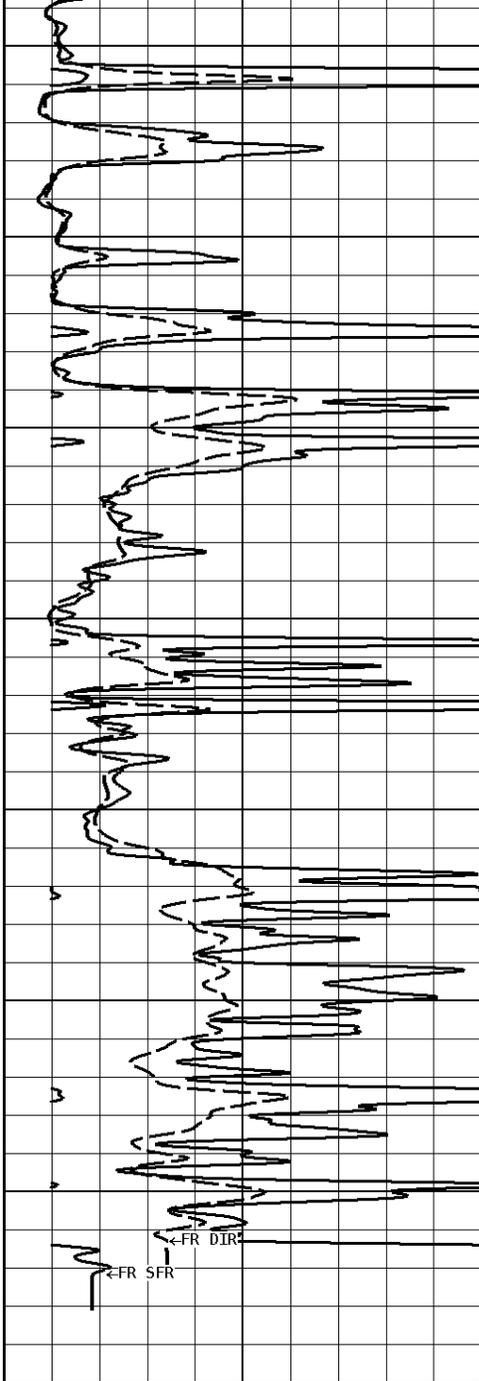
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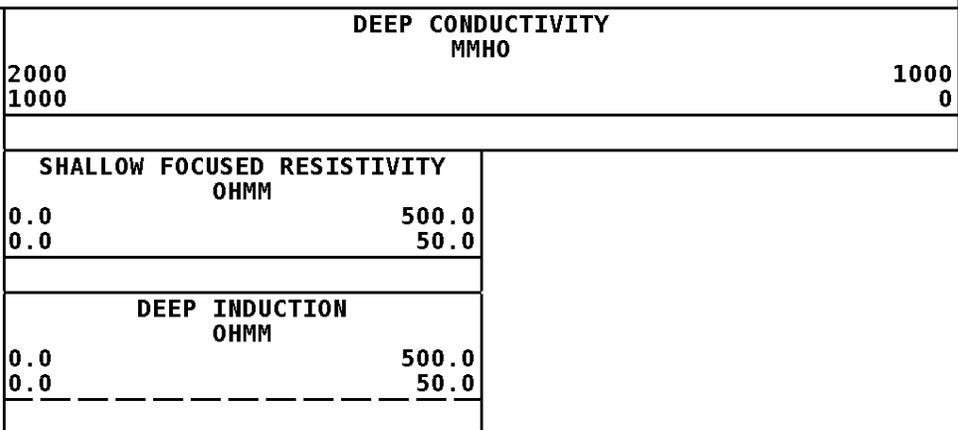
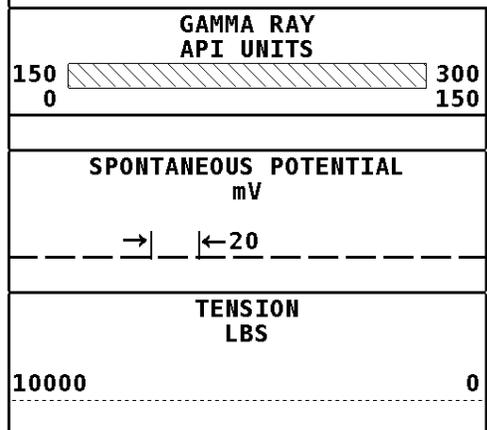
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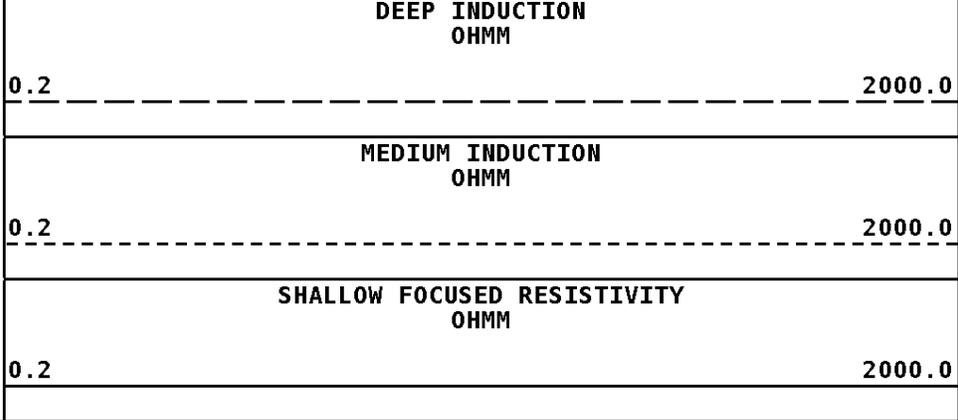
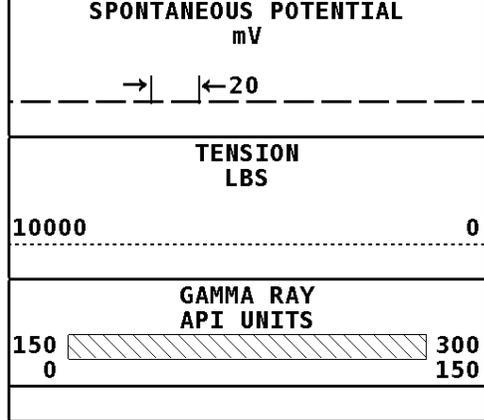
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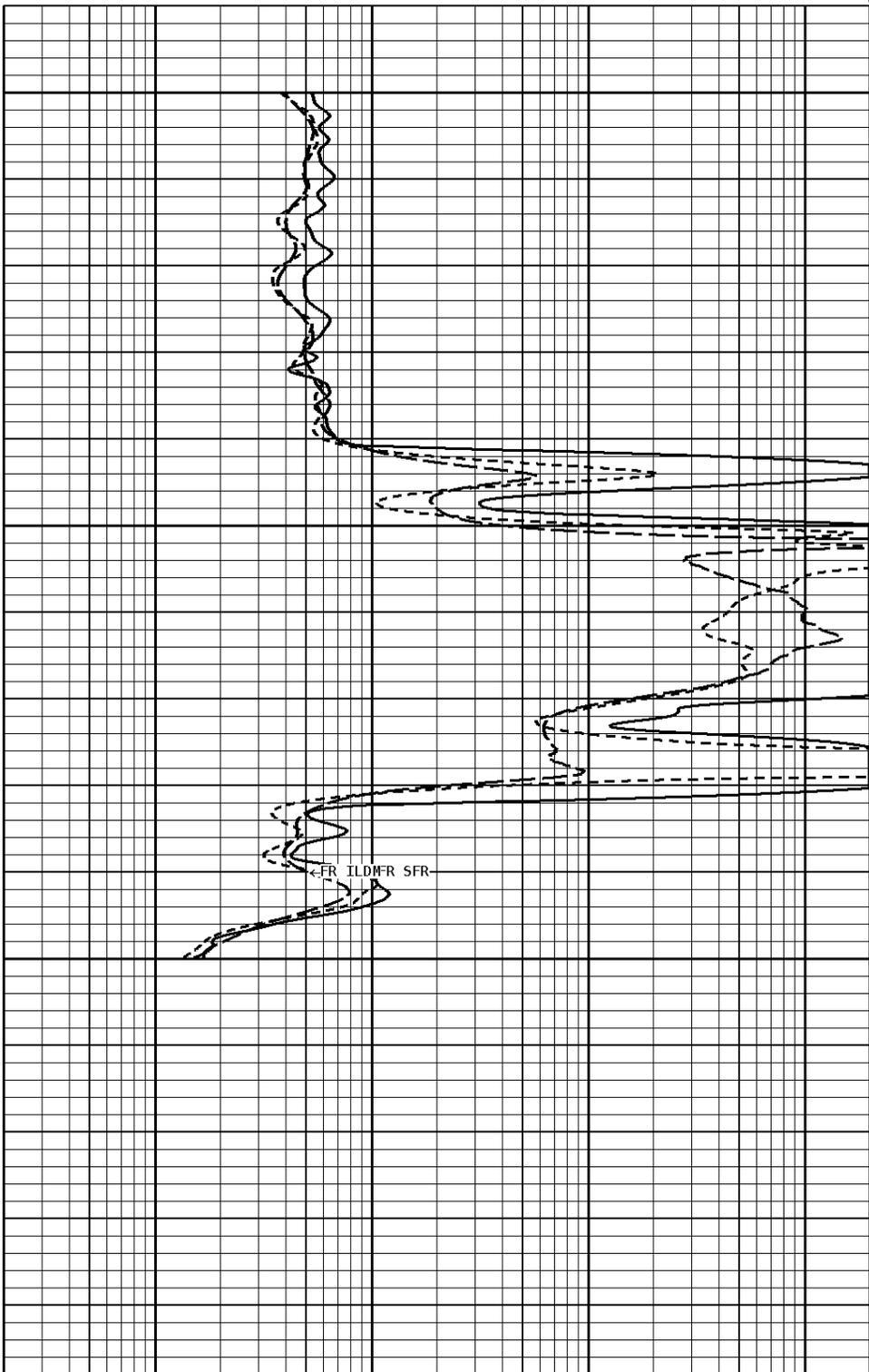
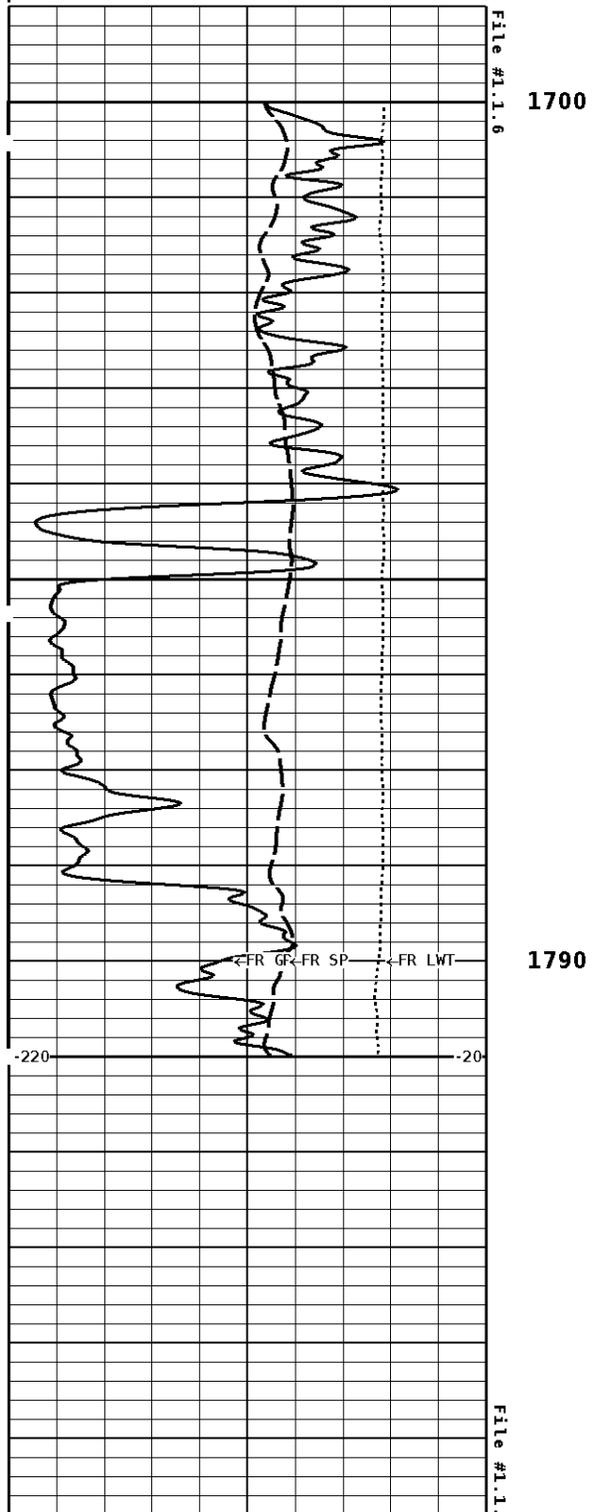
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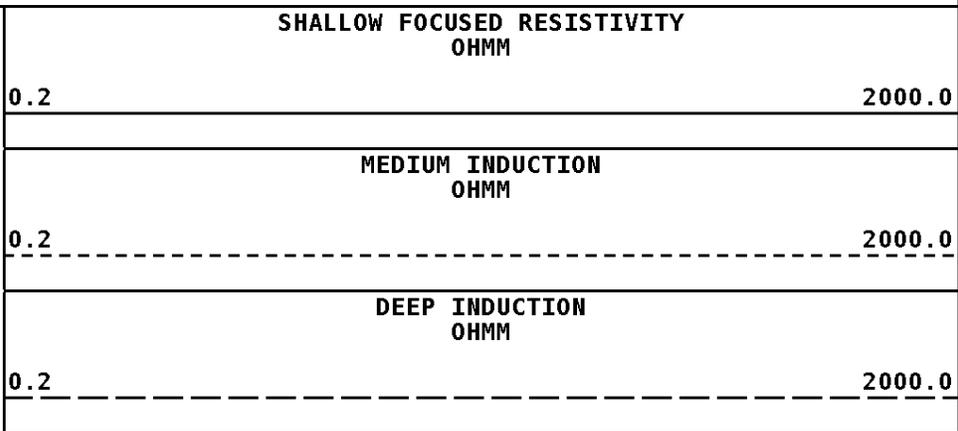
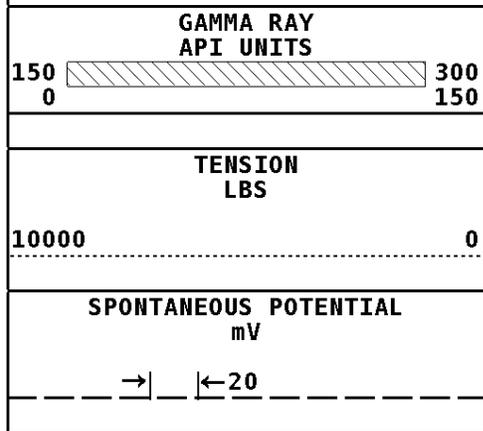




**1:240 MAIN SECTION**



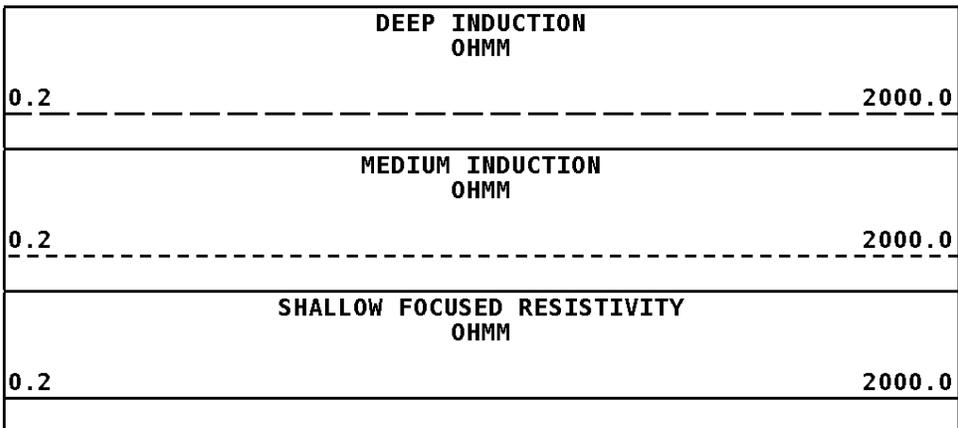
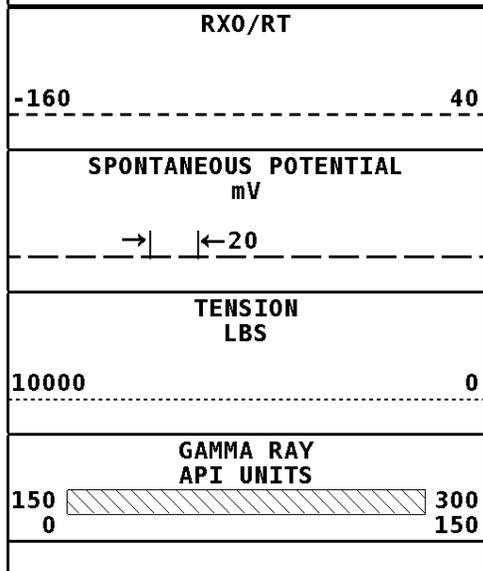
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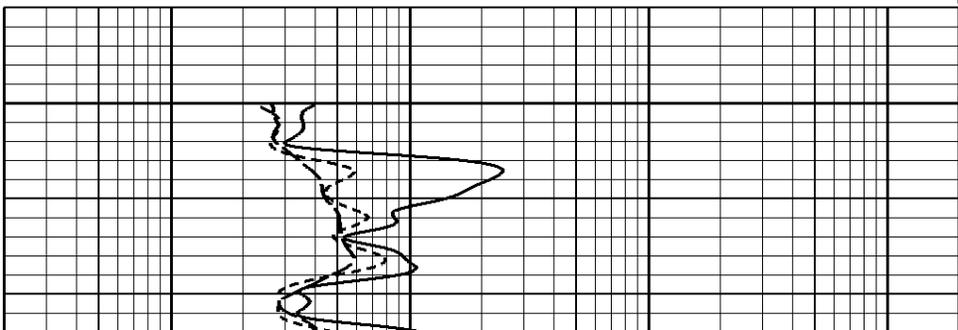
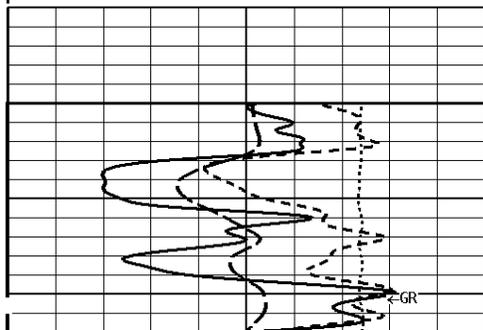
**\* Borehole Zone Factors \***

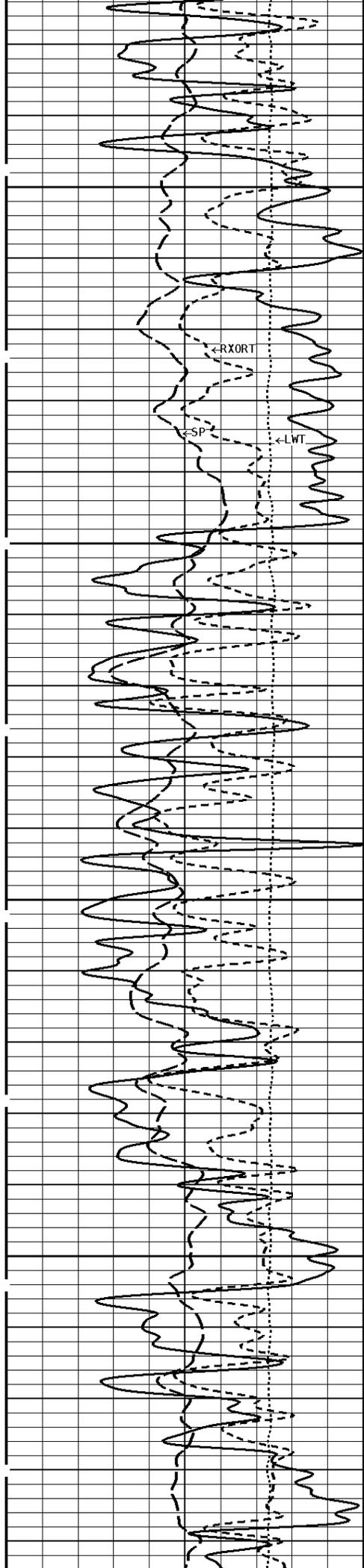
Zone 1 99999.0 to 0.0 Feet	
Drill Bit Size	7.875 in
Casing Diameter	5.500 in
BHT Depth	4075.000 ft
Borehole Temperature	120.0 degF
Temperature Gradient	1.00 DFHF
Resistivity Of Mud	1.000 ohmm
Resistivity Of Mud Temperature	79.00 degF

<b>Well File:</b> Berexco Lemke A 3 Mar16 Quint	<b>Scale:</b> 1:240	<b>Format:</b> DIL-240
<b>Segment:</b> V1.D1.S6 Reprocess MAIN	<b>Acquired:</b> 2020-03/16 18:22 3.4.1-13972	
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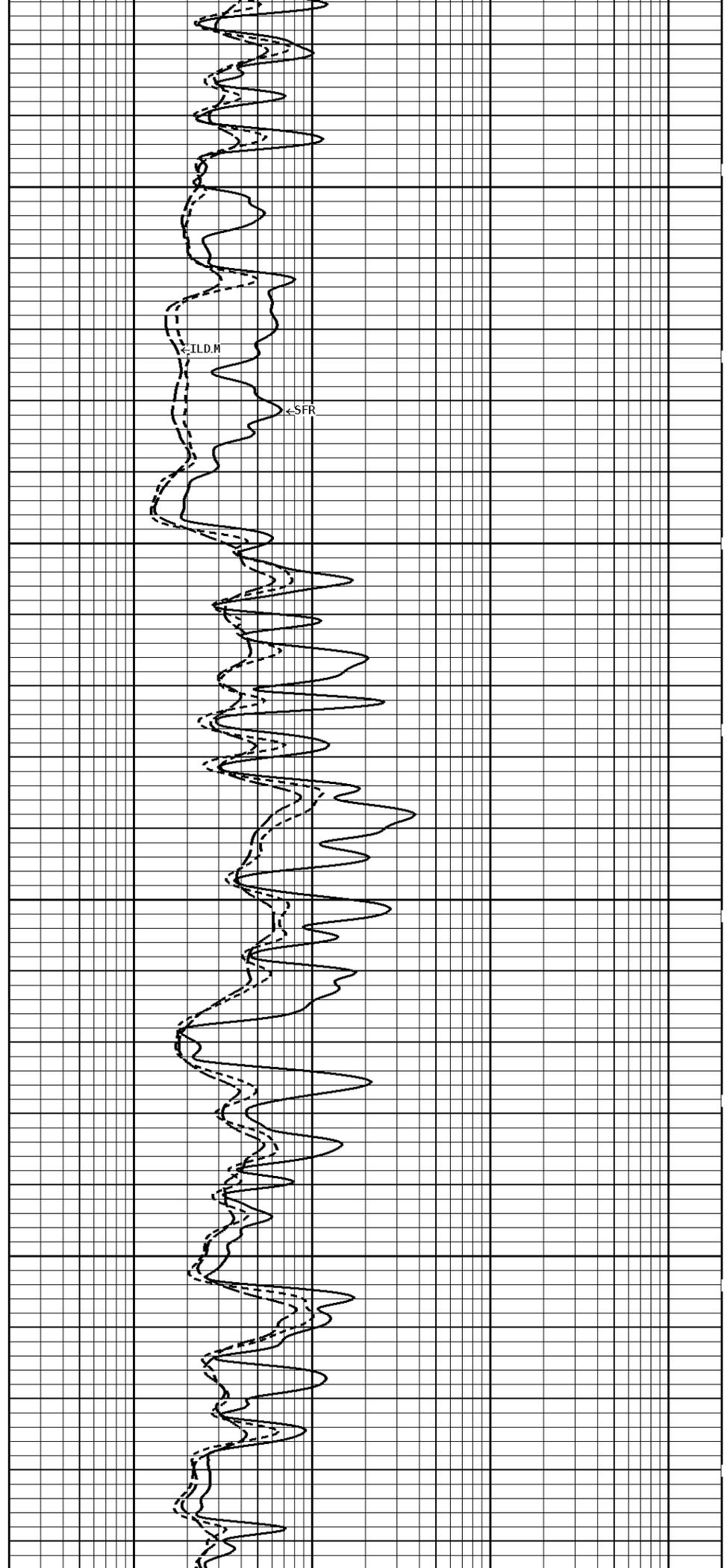
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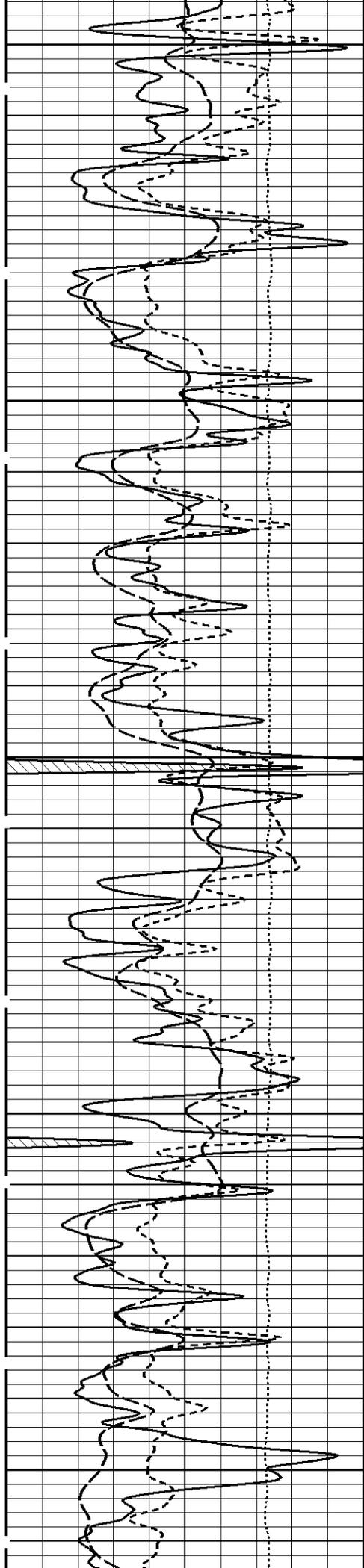




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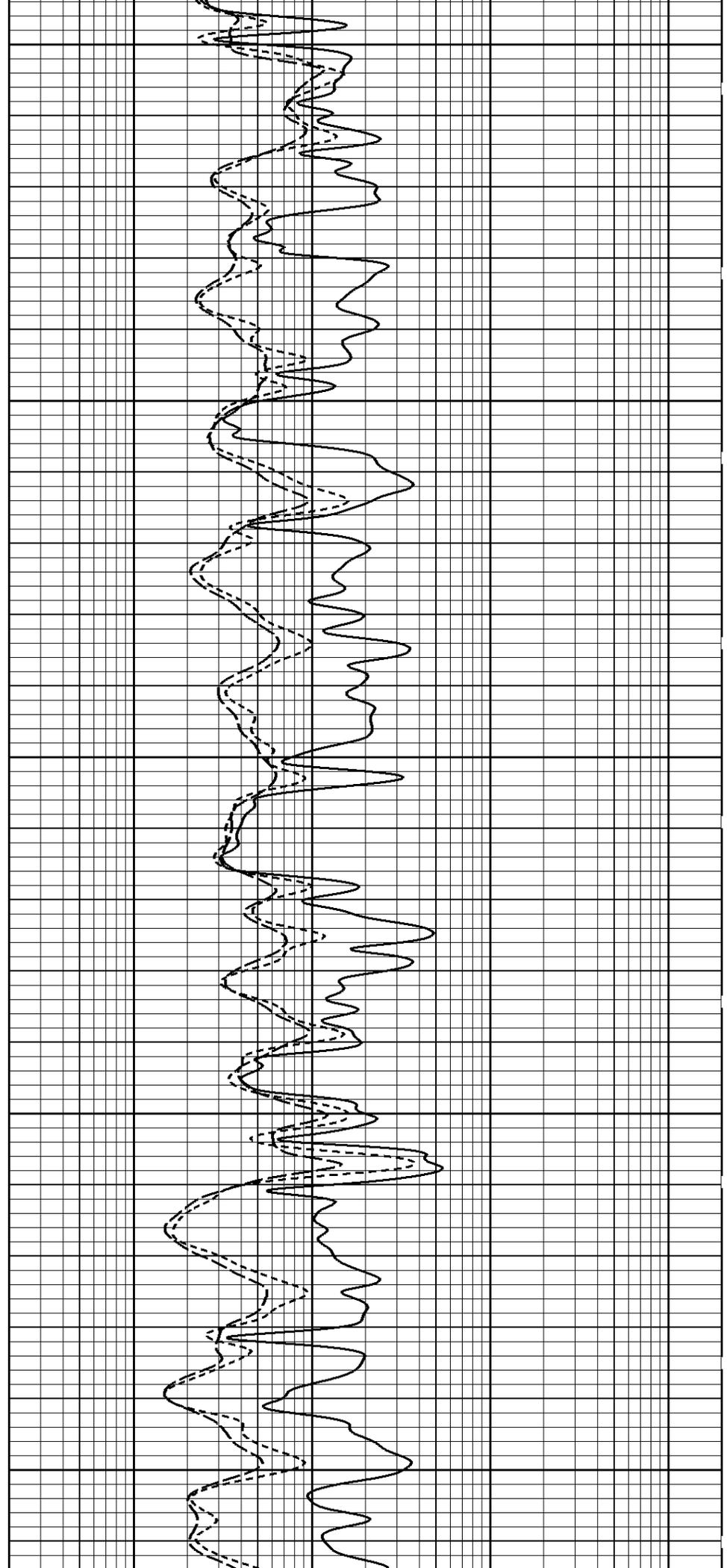
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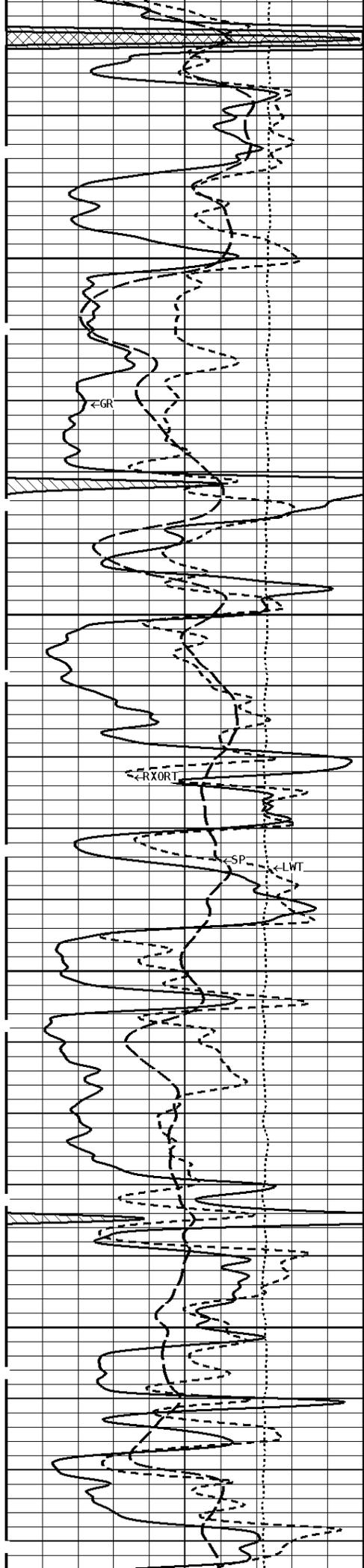




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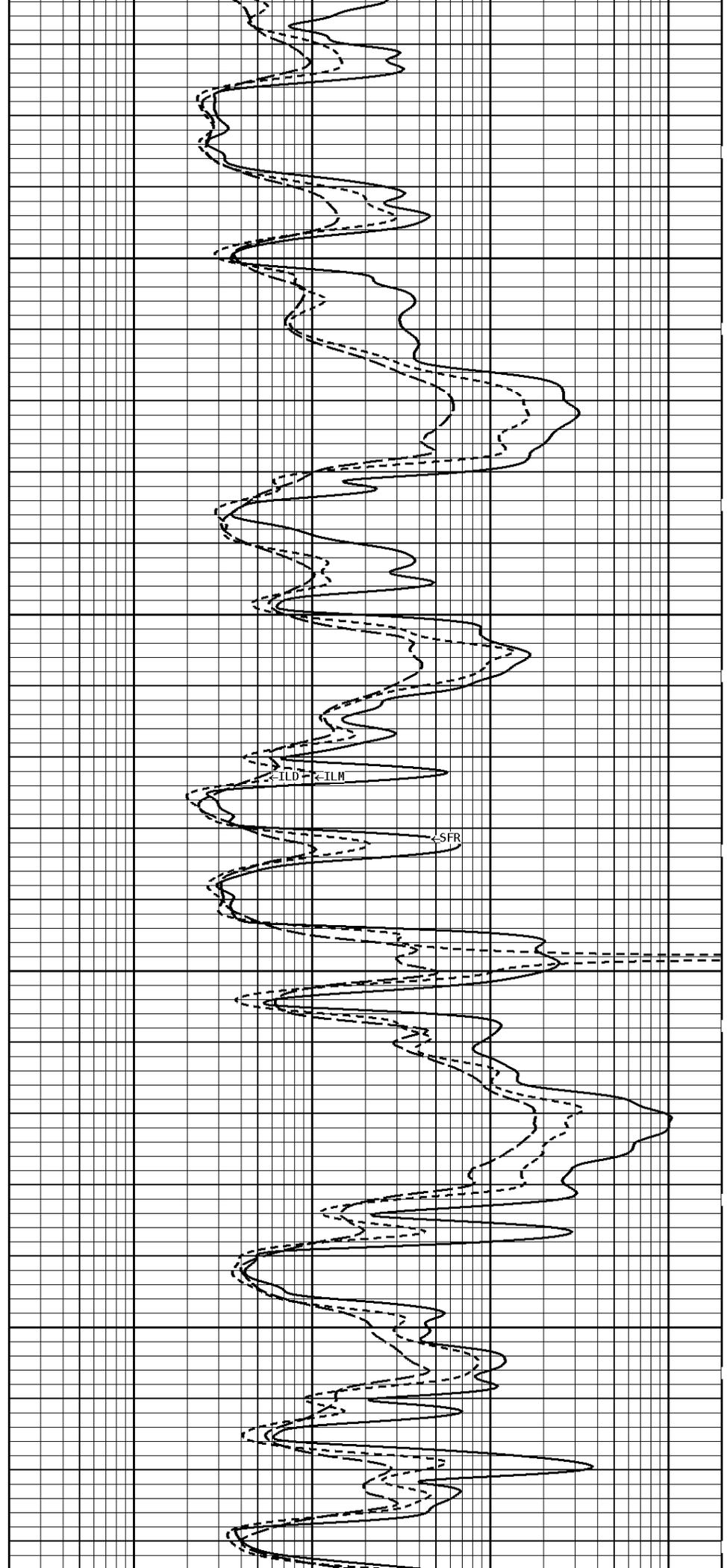
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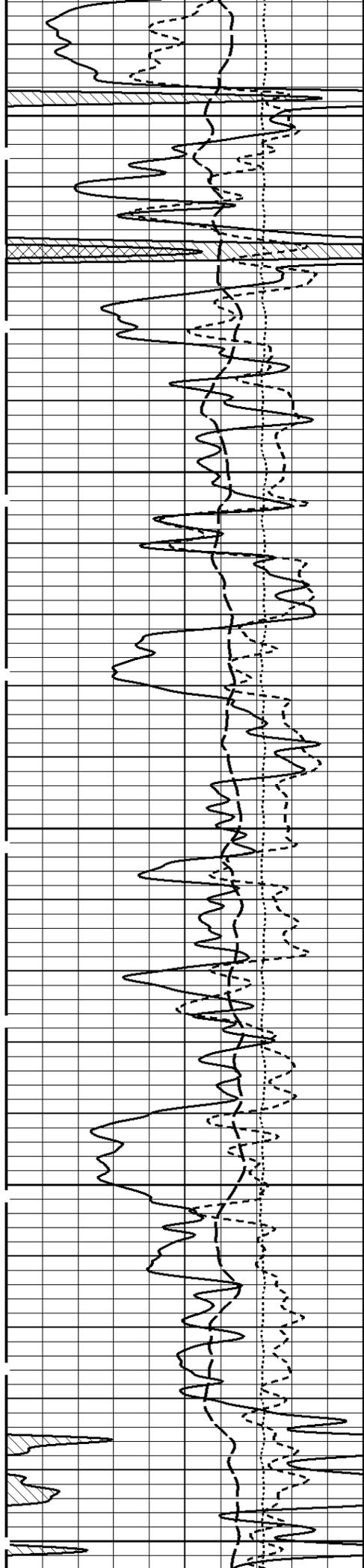




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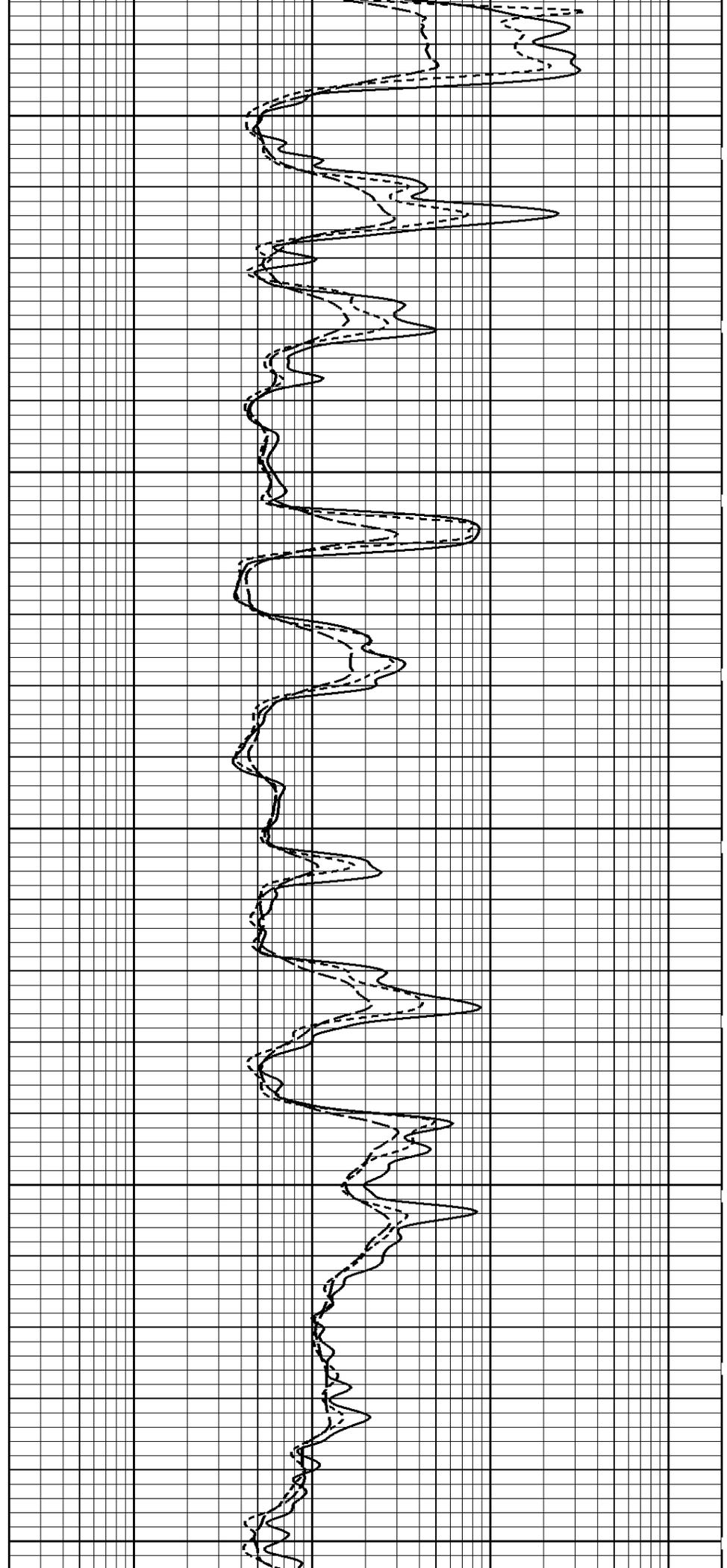


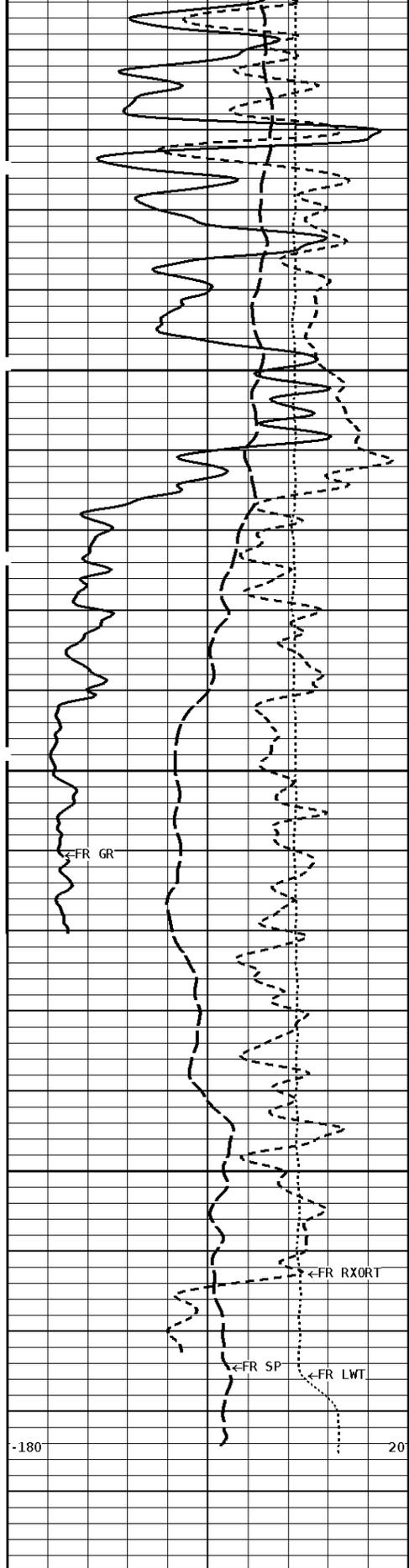


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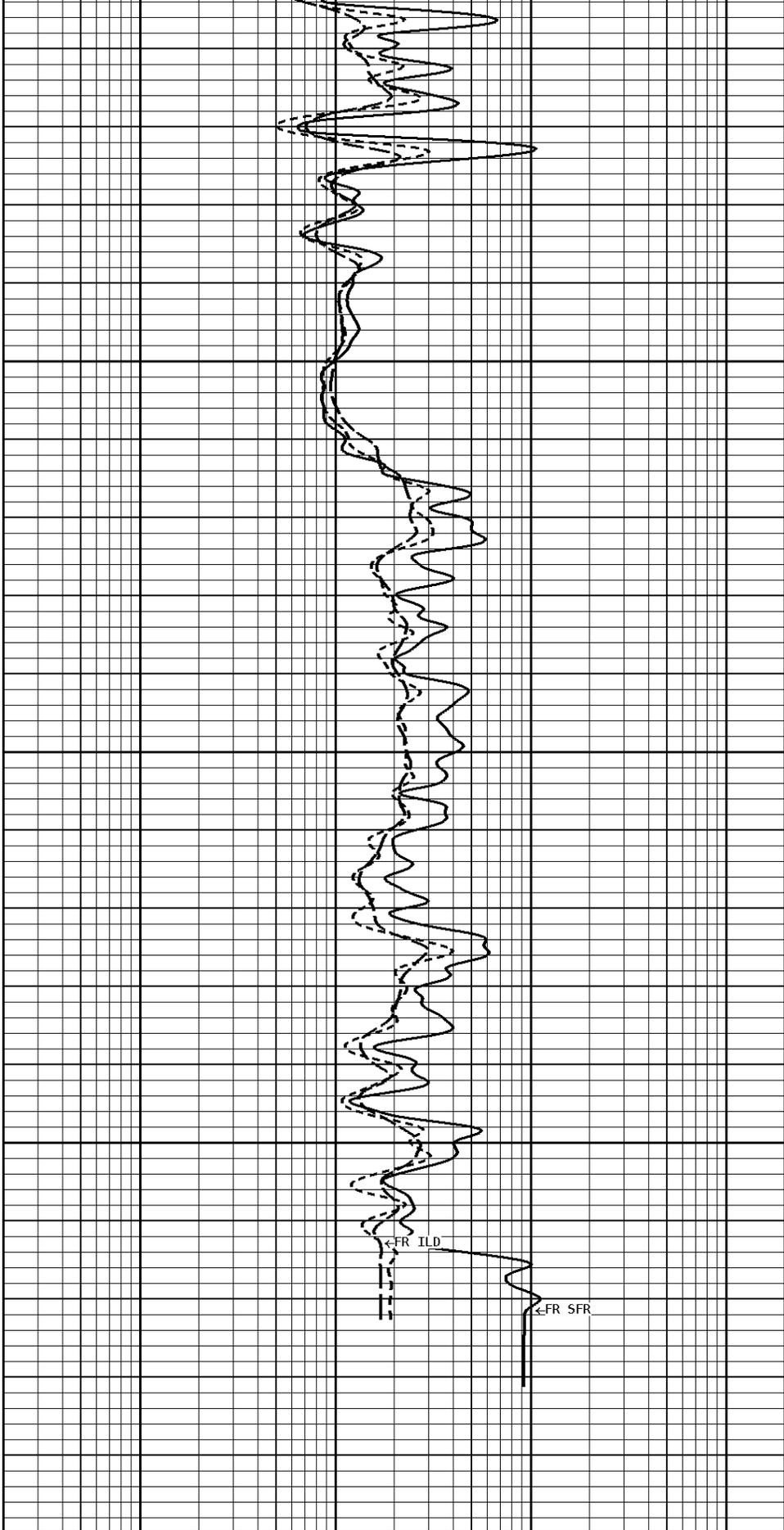
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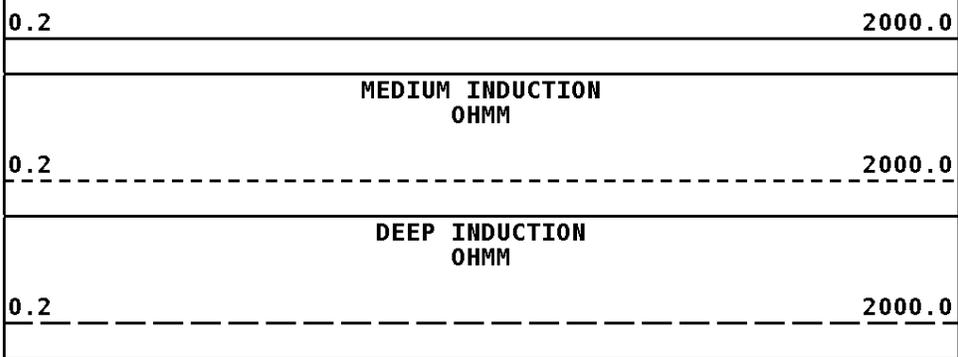
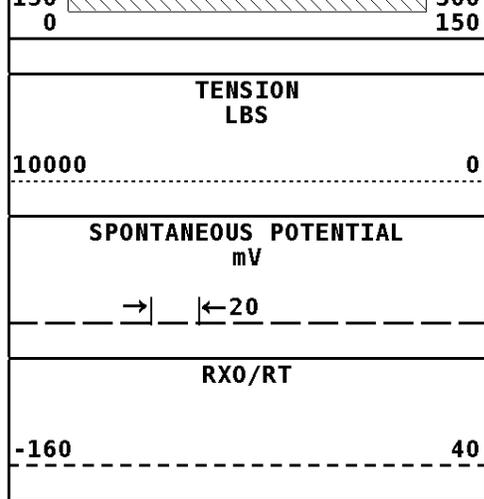


1:240 MAIN SECTION

GAMMA RAY  
API UNITS

150 300

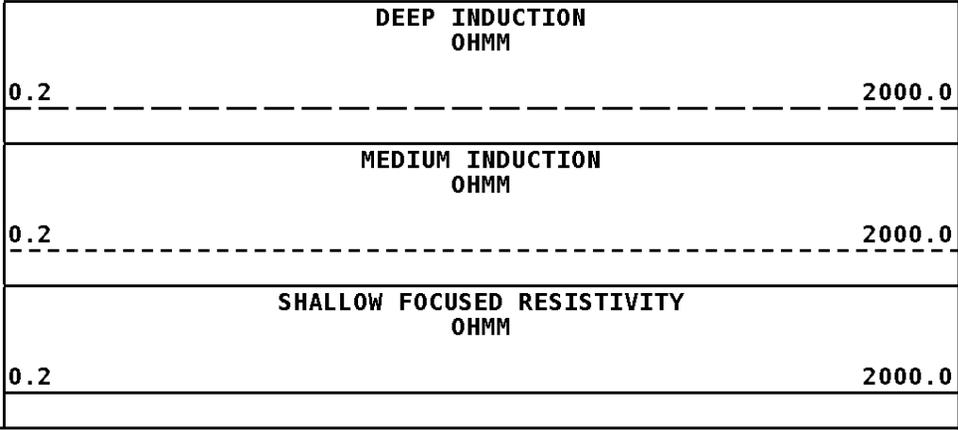
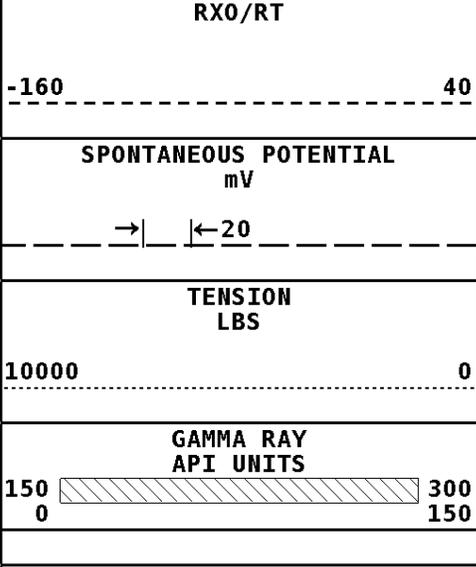
SHALLOW FOCUSED RESISTIVITY  
OHMM



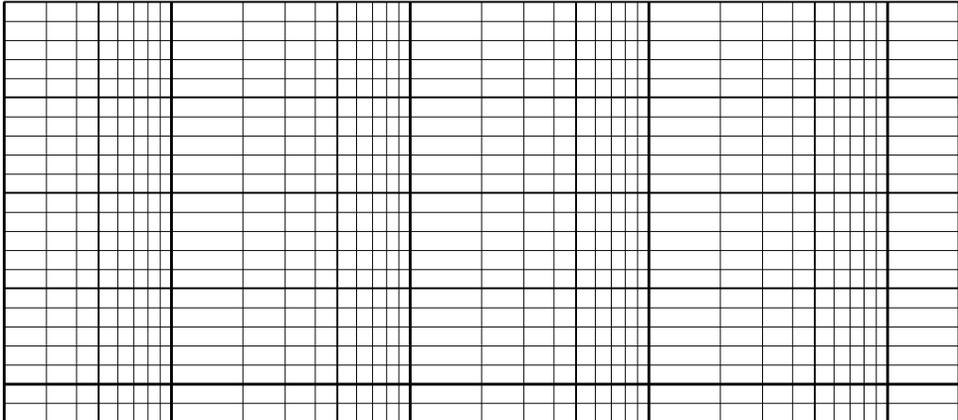
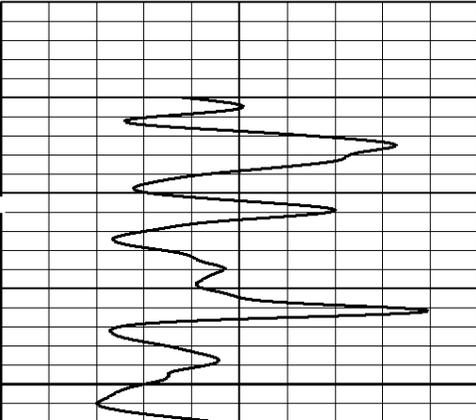
**\* Borehole Zone Factors \***

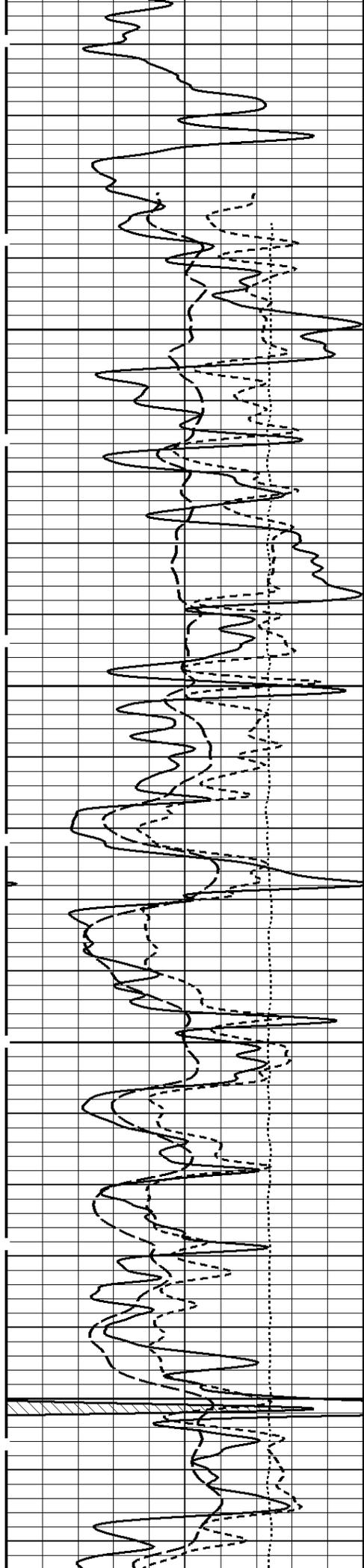
Zone 1 99999.0 to 0.0 Feet	
Drill Bit Size	7.875 in
Casing Diameter	5.500 in
BHT Depth	4075.000 ft
Borehole Temperature	120.0 degF
Temperature Gradient	1.00 DFHF
Resistivity Of Mud	1.000 ohmm
Resistivity Of Mud Temperature	79.00 degF

**Well File:** Berexco Lemke A 3 Mar16 Quint **Scale:** 1:240 **Format:** DIL-240  
**Segment:** V1.D1.S8 Reprocess REPEATSP **Acquired:** Not Available  
**Reference:** 0 **Processed:** Not Available



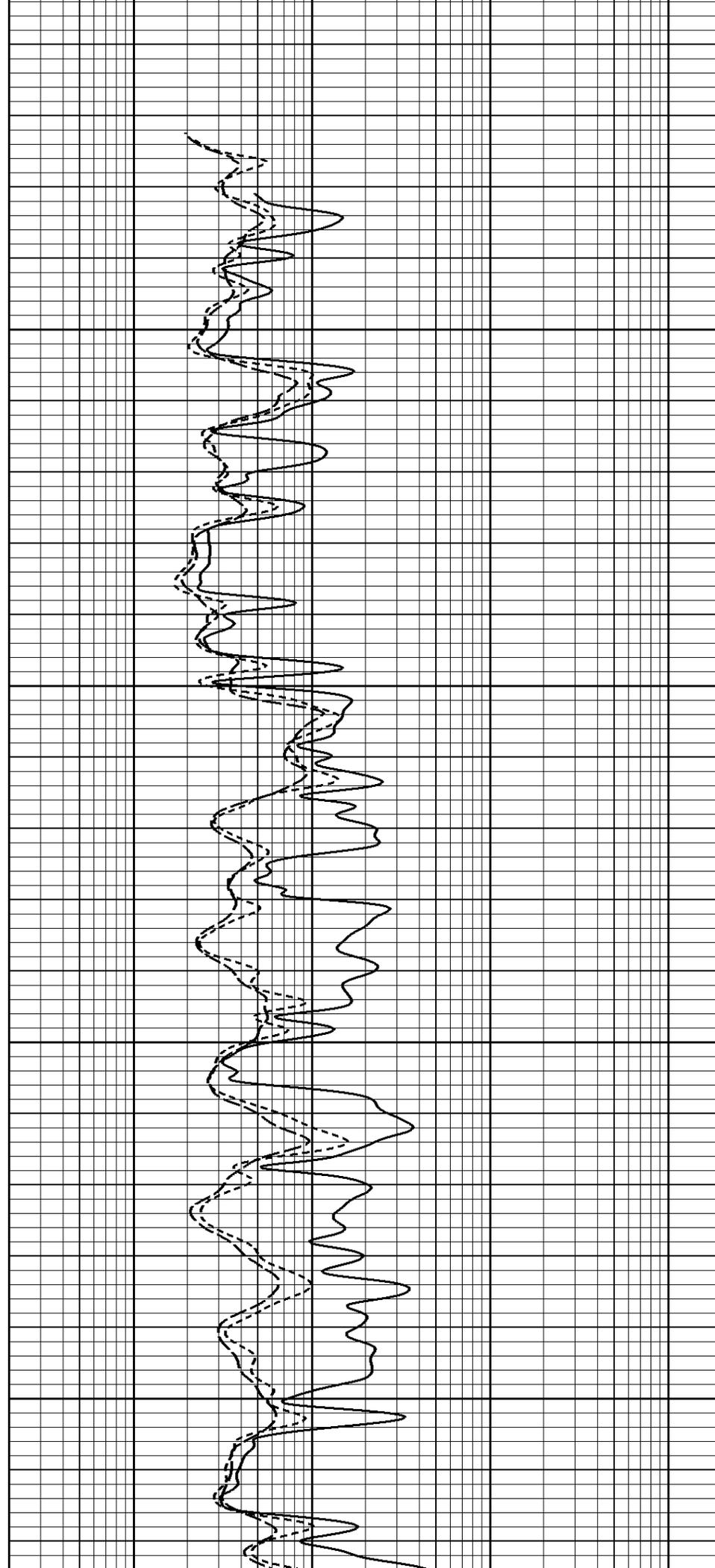
**1:240 REPEAT SECTION**

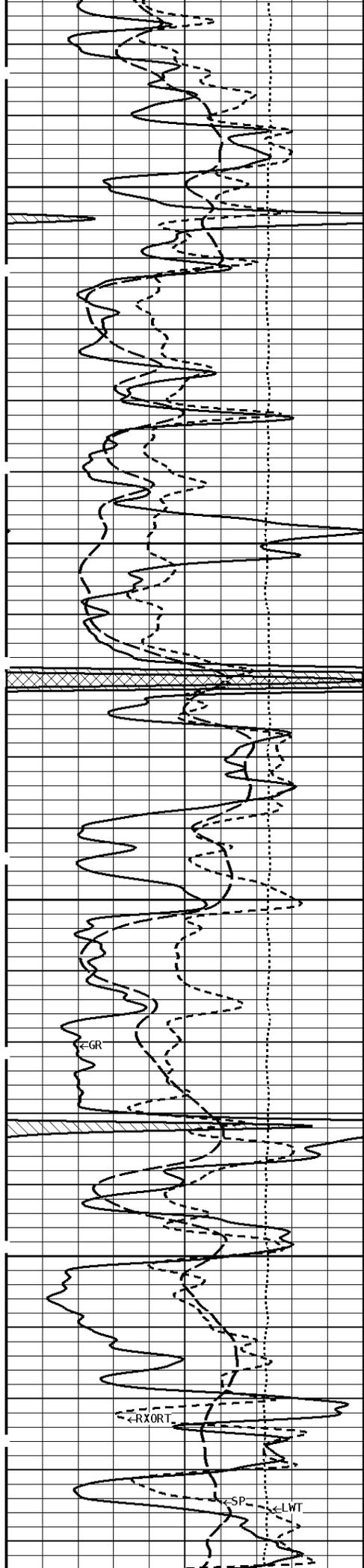




3200

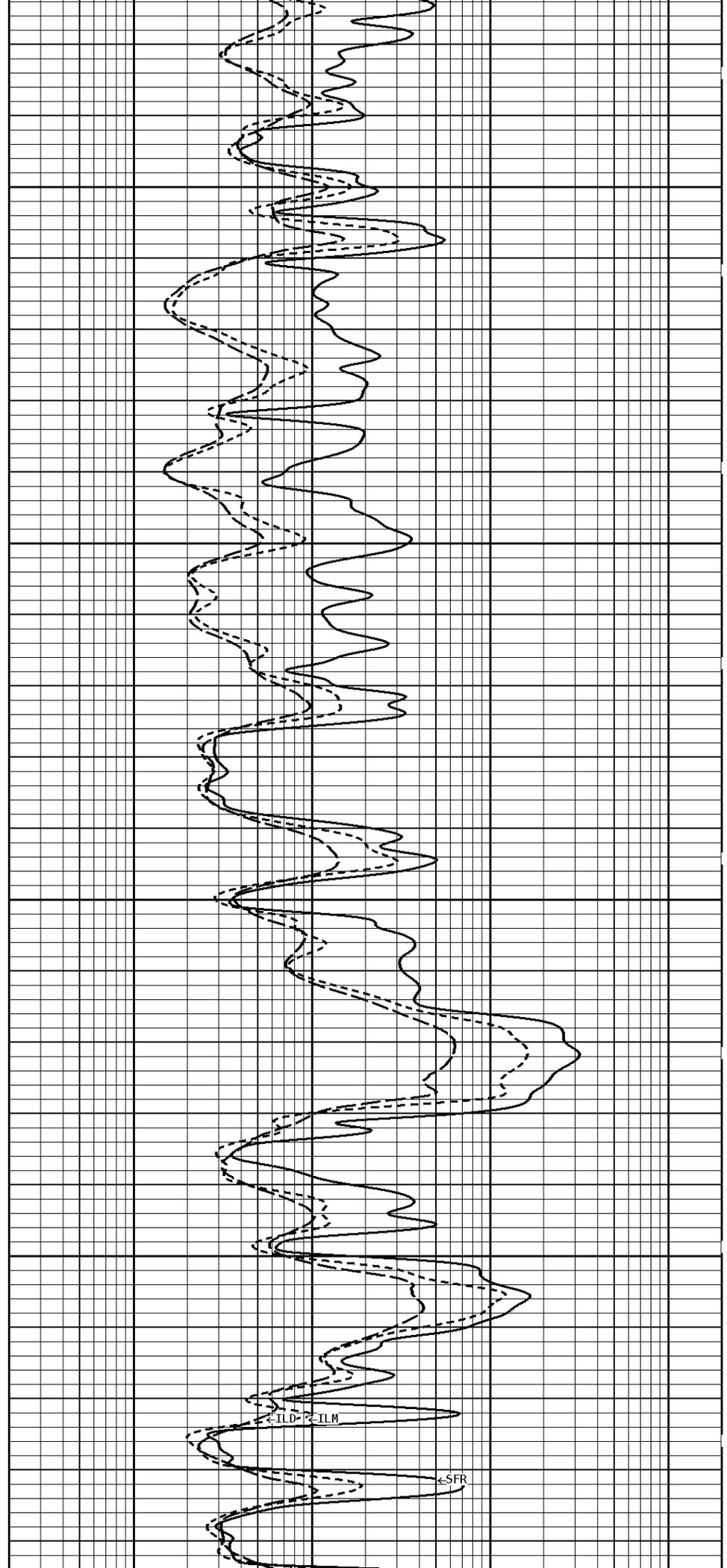
3300

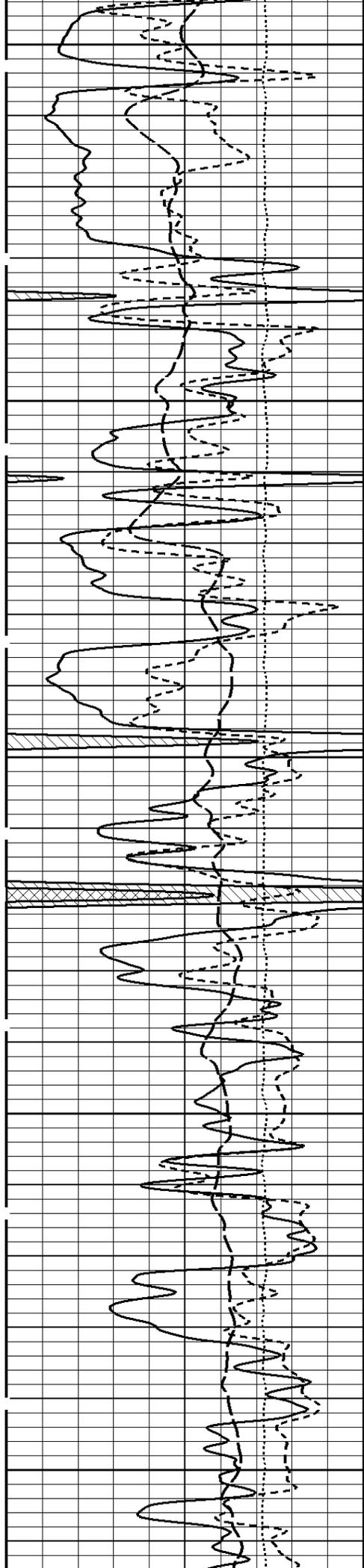




3400

3500

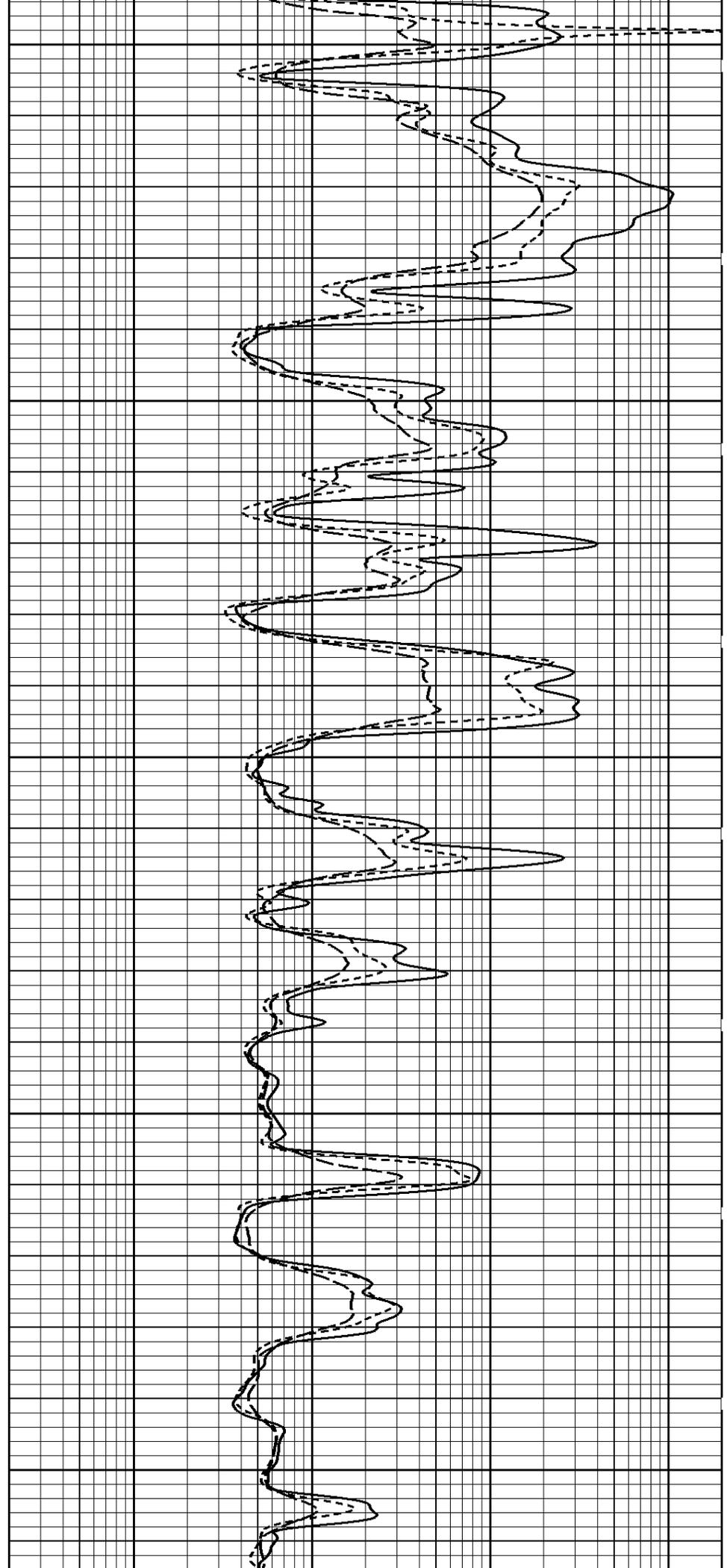


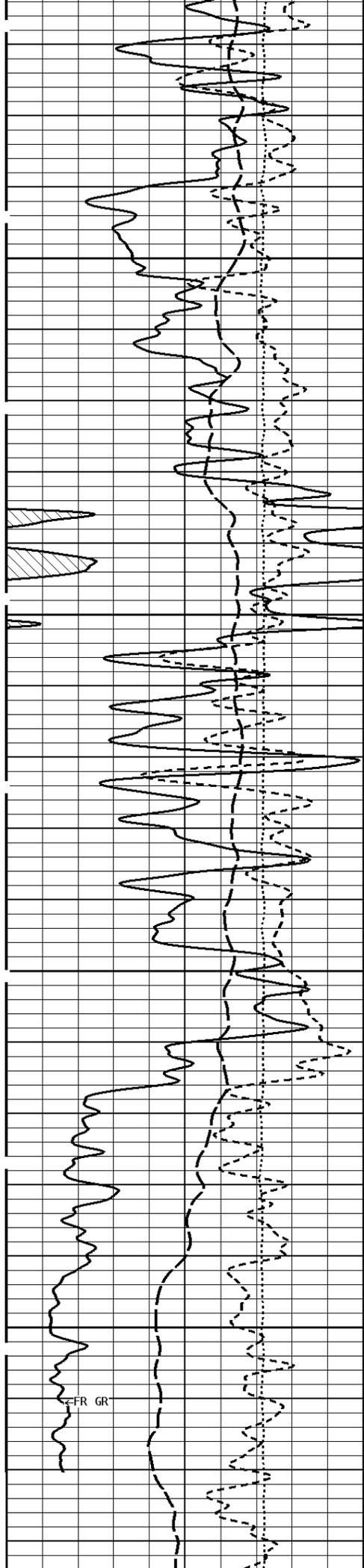


3600

3700

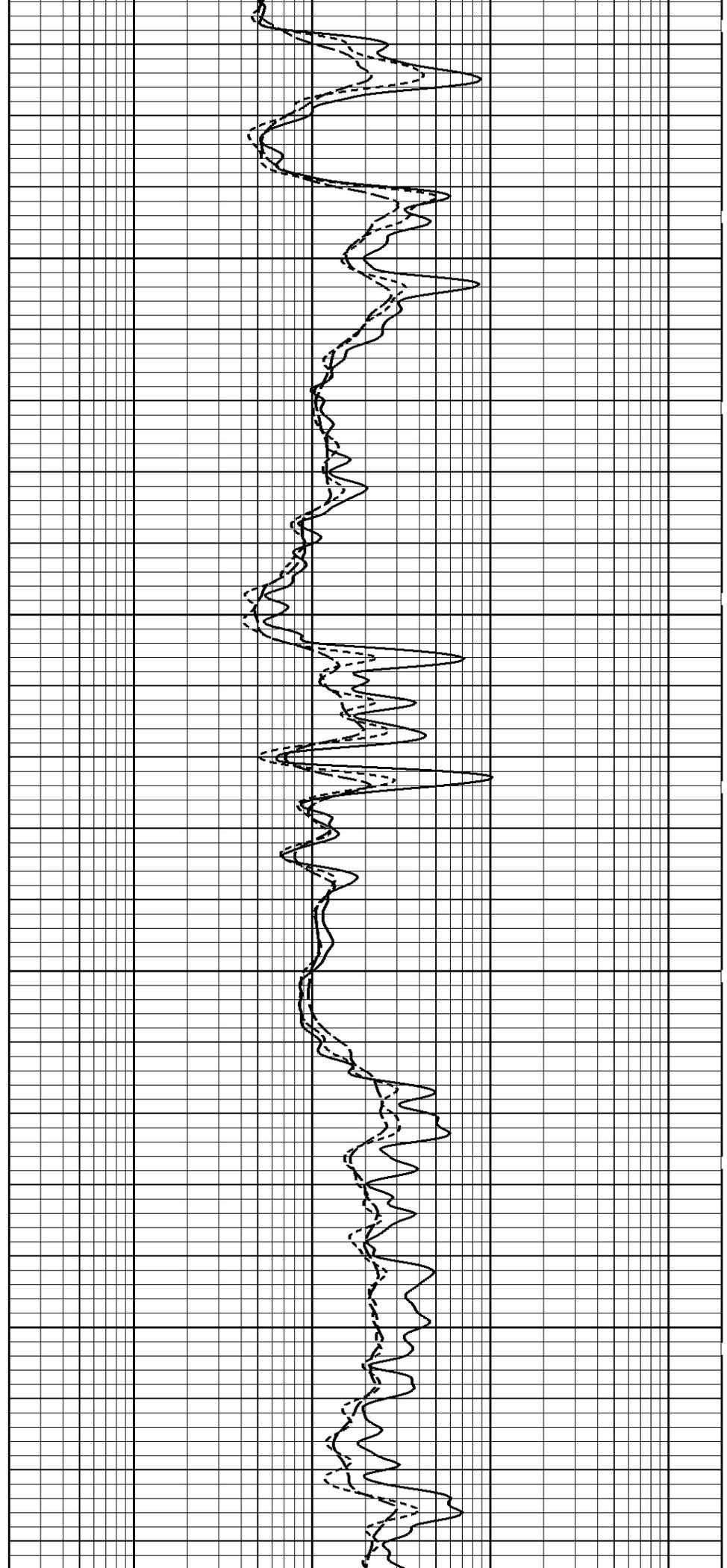
3800

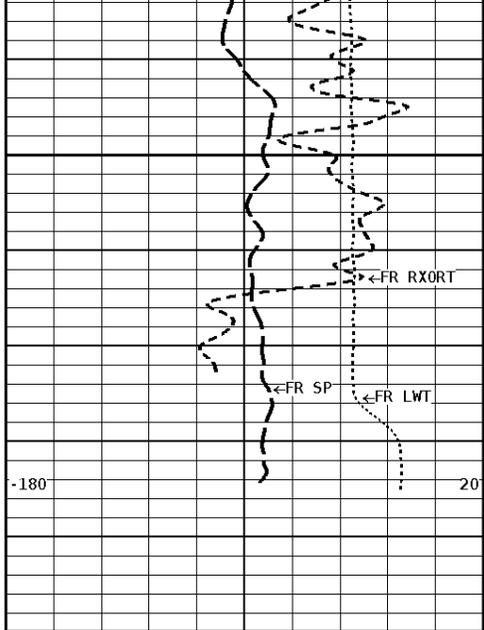




3900

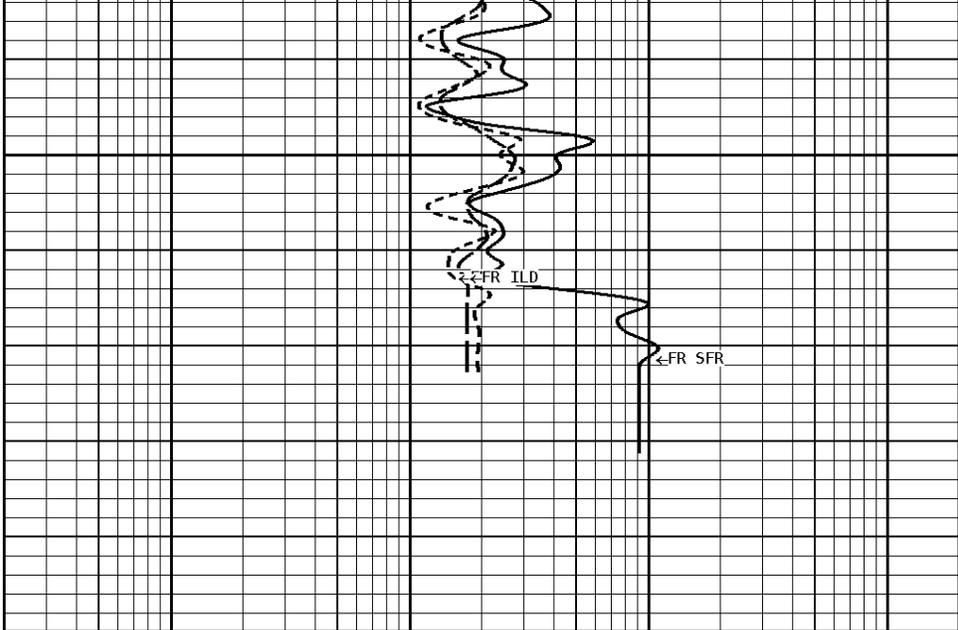
4000





4076

File #1.1.8



**1:240 REPEAT SECTION**

<b>GAMMA RAY API UNITS</b>	
150 0	300 150
<b>TENSION LBS</b>	
10000	0
<b>SPONTANEOUS POTENTIAL mV</b>	
→	← 20
<b>RXO/RT</b>	
-160	40

<b>SHALLOW FOCUSED RESISTIVITY OHMM</b>	
0.2	2000.0
<b>MEDIUM INDUCTION OHMM</b>	
0.2	2000.0
<b>DEEP INDUCTION OHMM</b>	
0.2	2000.0

**\*Calibration Summary \***

<b>Shop Calibration GRT-B</b>					
Performed : 24-JUN-2019			Time : 12:20		
Sensor Suite : GR-GR5			ID : GRT-BC-038		
	Measured	Units	Calibrated	Units	
GR	Background 36	Jig 266	Jig 160	CPS	GRAPI

<b>Shop Calibration PIT-CA</b>					
Performed : 21-DEC-2019			Time : 21:46		
Sensor Suite : P-IND-T			ID : PIT-AC-043		
	Measured		Calibrated		Units
	R	X	R	X	
Air	131492	129685	0.0	0.0	MMHOS
Zero	131066	131062	-18.1	59.6	MMHOS
Reference	244915	244454	4981.9	5059.6	MMHOS
Loop	130404	210498	3515.7	3611.2	MMHOS
Sonde Error			-0.5	-1.7	MMHOS
Cond			4981.9	5059.6	MMHOS

	Measured		Calibrated		Units

Measured		Calibrated		Units
R	X	R	X	
Air	131939 129230	0.0	-0.0	MMHOS
Zero	131079 131067	-15.6	35.3	MMHOS
Reference	220620 224092	1984.4	2035.3	MMHOS
Loop	129308 206166	1595.4	1712.8	MMHOS
Sonde Error		-0.6	-7.8	MMHOS
Cond		1984.4	2035.3	MMHOS

Temperature				
Measured		Calibrated		Units
Low	High	Low	High	
16980.0	56920.0	70.0	350.0	DEGF

Performed : 21-DEC-2019	Time : 21:46
Sensor Suite : SFL	ID : PIT-AC-043

Measured		Calibrated		Units
Zero	Reference	Zero	Reference	
Im	32732.6 48929.1	0.0	7028.0	uA
Ib	32768.6 49680.1	0.0	1750.0	mA
MOM1	32722.0 56290.6	0.0	175.0	mV
Equivalent SFL			43.97	OHMM

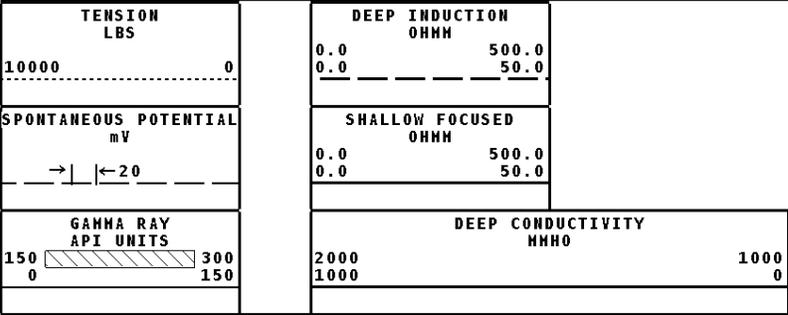
  

Performed : 21-DEC-2019	Time : 21:47
Sensor Suite : P-SP	ID : PIT-AC-043

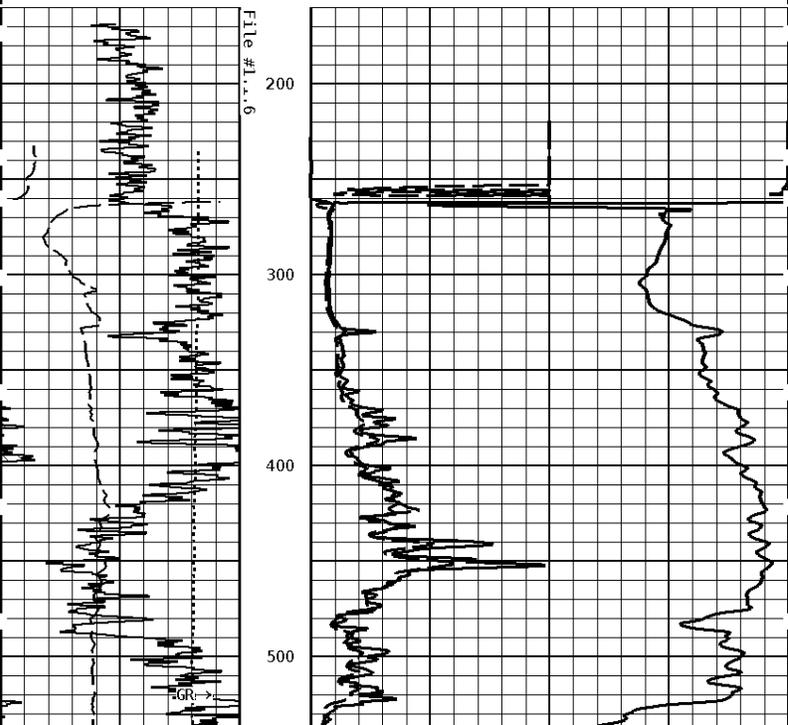
  

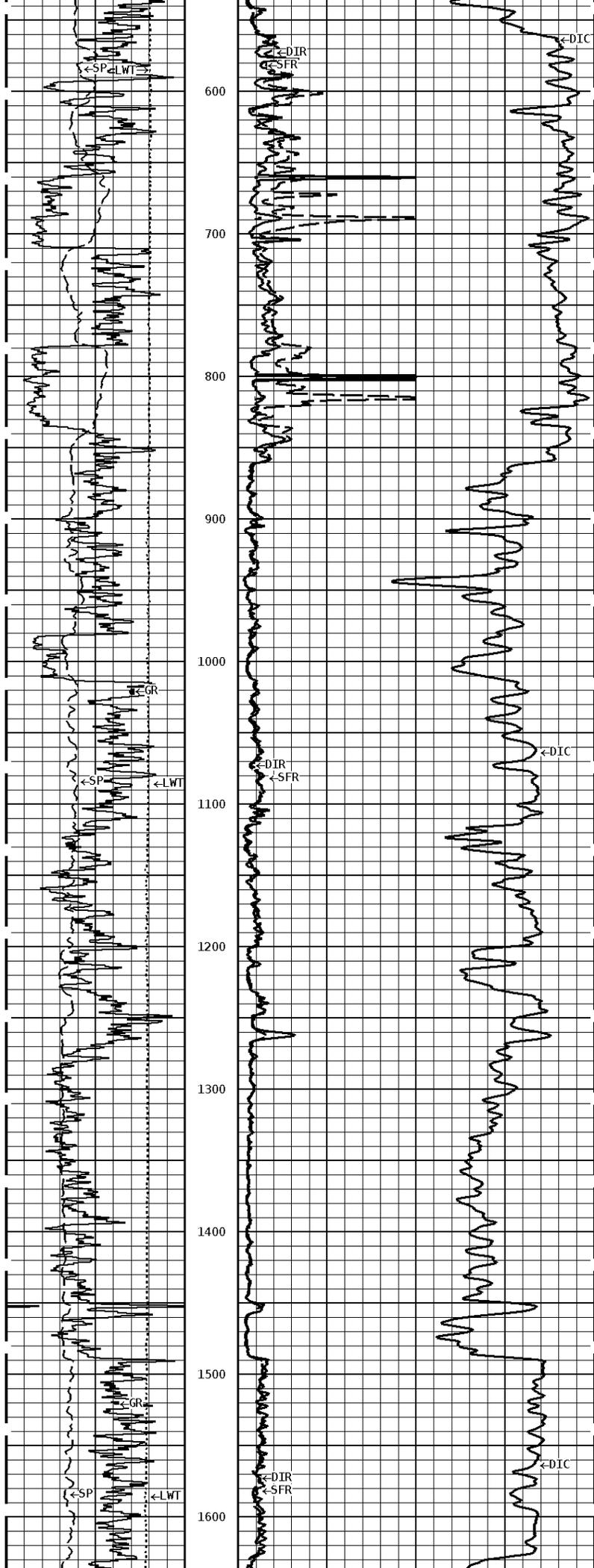
Measured		Calibrated		Units
Zero	Reference	Zero	Reference	
32774.5	58935.9	0.0	1000.0	mV

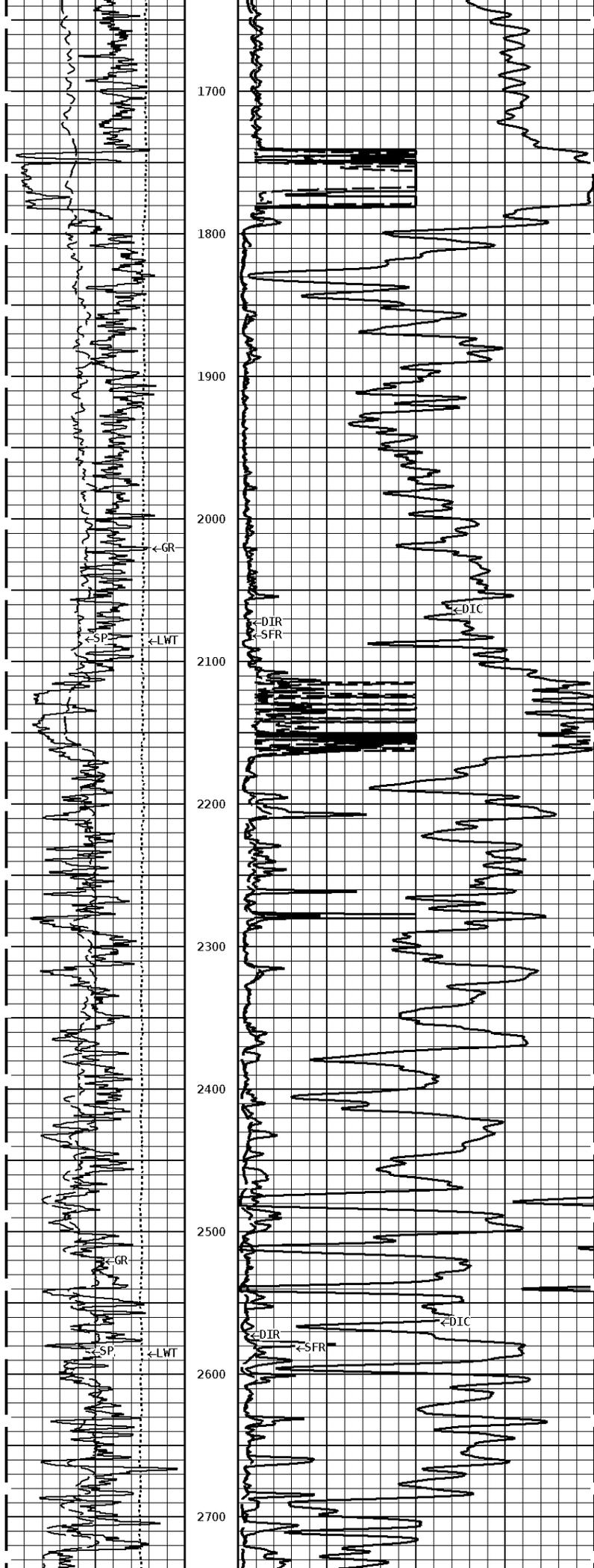
Well File: Berexco Lemke A 3 Mar16 Quint      Scale: 1:1200      Format: DIL1200  
Segment: V1.D1.S6 Reprocess MAIN      Acquired: 2020-03/16 18:22 3.4.1-13972  
Reference: 0      Processed: 2020-03/16 19:59 3.4.1-13972

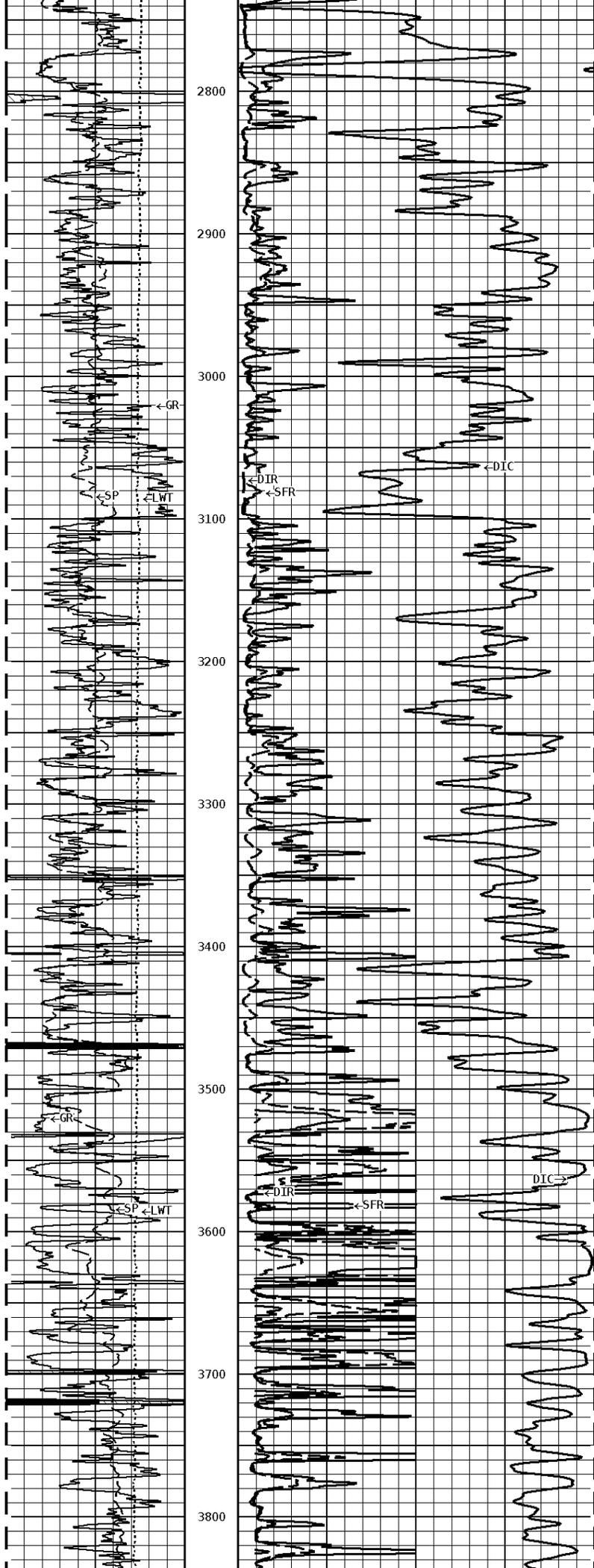


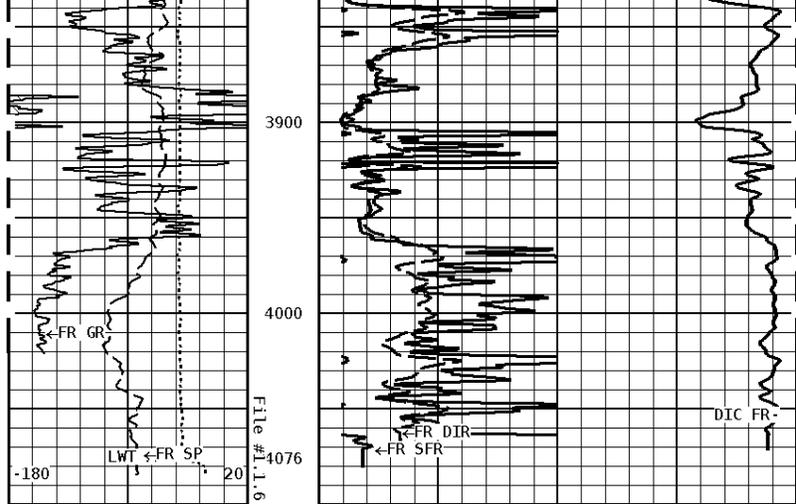
**1:1200 MAIN SECTION**



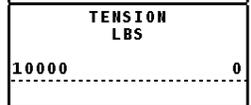
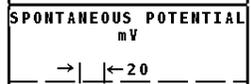








**1:1200 MAIN SECTION**



Company: BEREXCO, LLC.  
 Well: LEMKE 'A' #3  
 Location: 330' FSL & 1320' FWL  
 Logged: 03-16-2020  
 K.B. Elev: 2271.0 Ft