



DUAL INDUCTION LOG

Company	PIONEER OPERATIONS, LLC.	Company	PIONEER OPERATIONS, LLC.
Well	RICHERSON #1	Well	RICHERSON #1
Field	UNNAMED	Field	UNNAMED
County	ROOKS	County	ROOKS
State	KANSAS	State	KANSAS
Location:	API # : 15-163-24484-0000	Other Services CDL/CNL	
Permanent Datum	GROUND LEVEL	Elevation	1980
Log Measured From	KELLY BUSHING 7' A.G.L.	K.B. 1987 D.F. 1985 G.L. 1980	
Drilling Measured From	KELLY BUSHING		
Date	8/15/23		
Run Number	ONE		
Depth Driller	3480		
Depth Logger	3470		
Bottom Logged Interval	3468		
Top Log Interval	00		
Casing Driller	8 5/8"@218'		
Casing Logger	218		
Bit Size	7 7/8"		
Type Fluid in Hole	CHEMICAL MUD	CHLORIDES 2,400 PPM	
Density / Viscosity	9.2/63		
pH / Fluid Loss	10.5/5.8		
Source of Sample	FLOWLINE		
Rm @ Meas. Temp	1.10@83F		
Rmf @ Meas. Temp	.825@83F		
Rmc @ Meas. Temp	1.32@83F		
Source of Rmf / Rmc	MEASUREMENT		
Rm @ BHT	.823@111F		
Time Circulation Stopped	2 HOURS		
Time Logger on Bottom	12:30 P.M.		
Maximum Recorded Temperature	111F		
Equipment Number	922339		
Location	HAYS, KANSAS		
Recorded By	JEFF LUEBBERS		
Witnessed By	JANEL STAAB	DAN WELLS	

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, 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. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

15-163-24484-0000

Comments

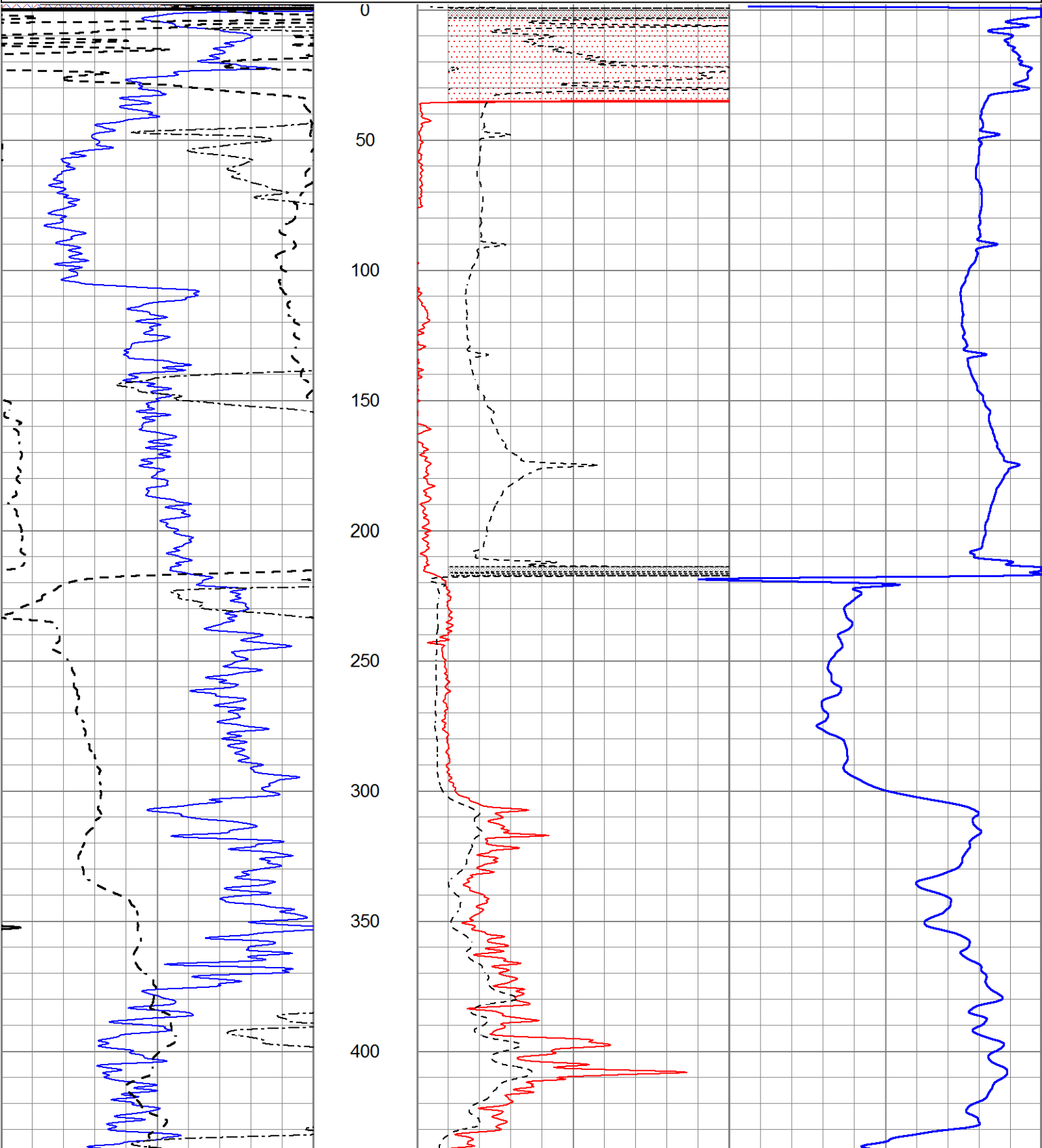
THANK YOU FOR USING ELI WIRELINE HAYS, KANSAS (785) 628-6395
DIRECTIONS
PLAINVILLE, KS., (4 WAY STOP) 9N. ON HWY 183 TO "N TERR RD." (WILKENS) 1W., 1/2S. TO
CURVE, 3 1/2W. TO "RD. 13", 1N., E. INTO

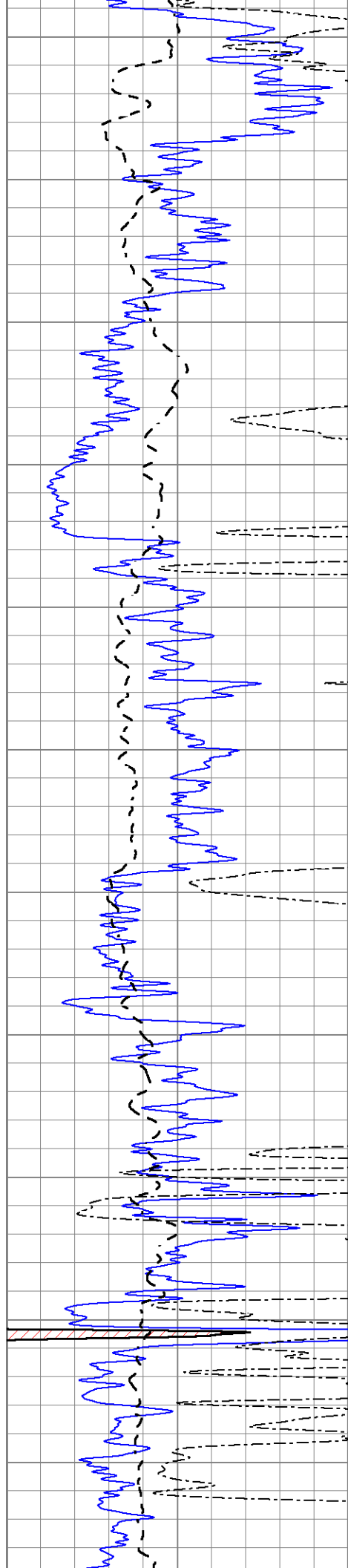


MAIN SECTION

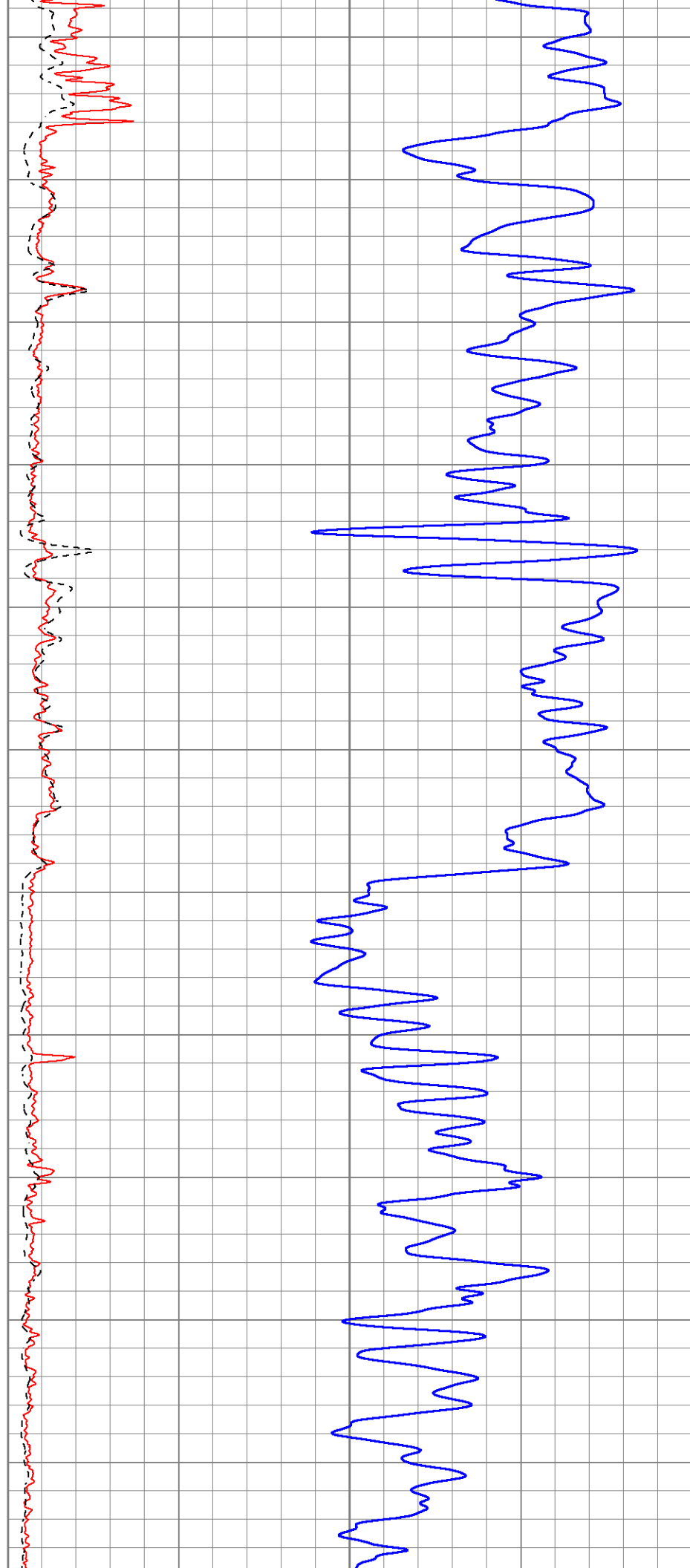
Database File	7319ddn.db
Dataset Pathname	pass3.1M
Presentation Format	_dil2
Dataset Creation	Tue Aug 15 13:47:33 2023
Charted by	Depth in Feet scaled 1:600

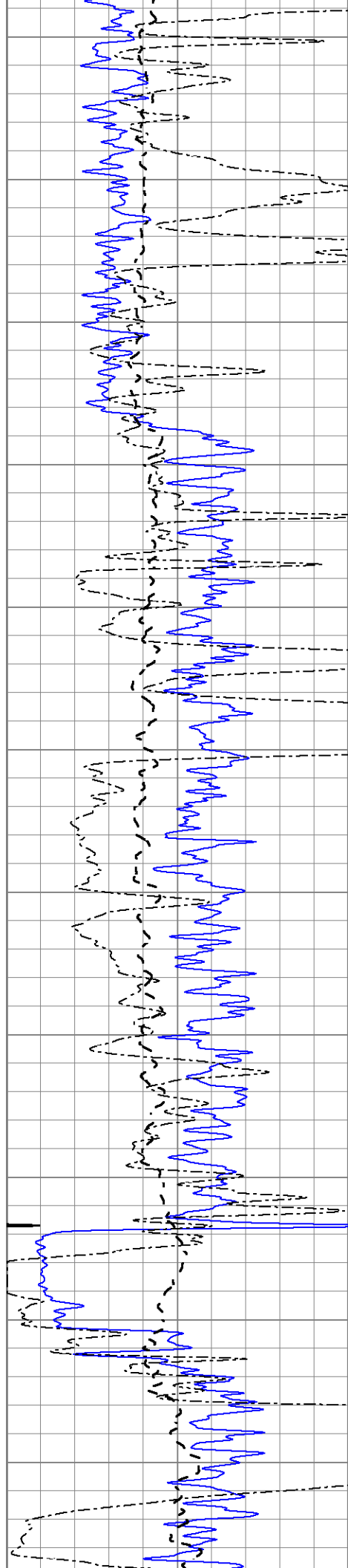
0	Gamma Ray (GAPI)	150	1000	CILD (mmho/m)	0
-100	SP (mV)	100	0	RLL3 (Ohm-m)	50
0	RWA (Ohm-m)	1	0	RILD (Ohm-m)	50
			50	RILD X10 (Ohm-m)	500
			50	RLL3 X10 (Ohm-m)	500



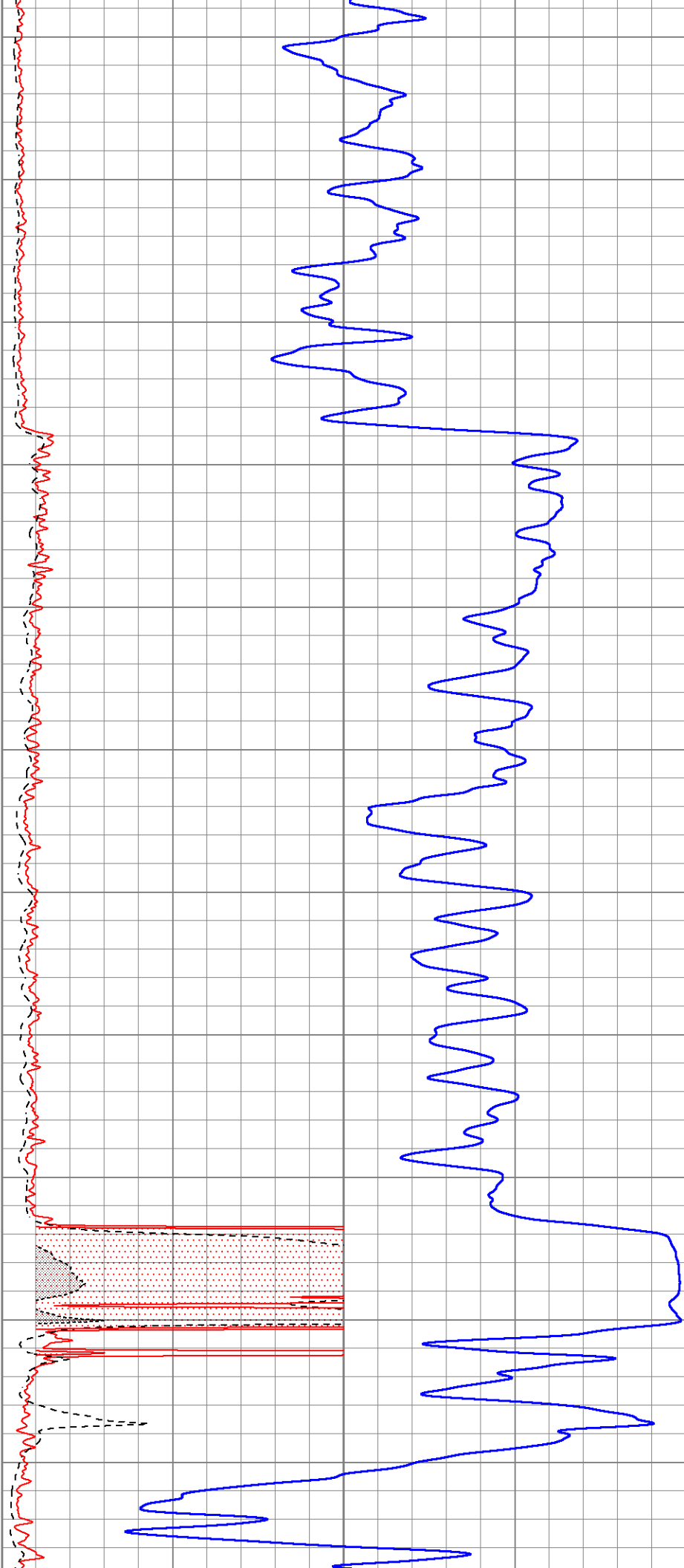


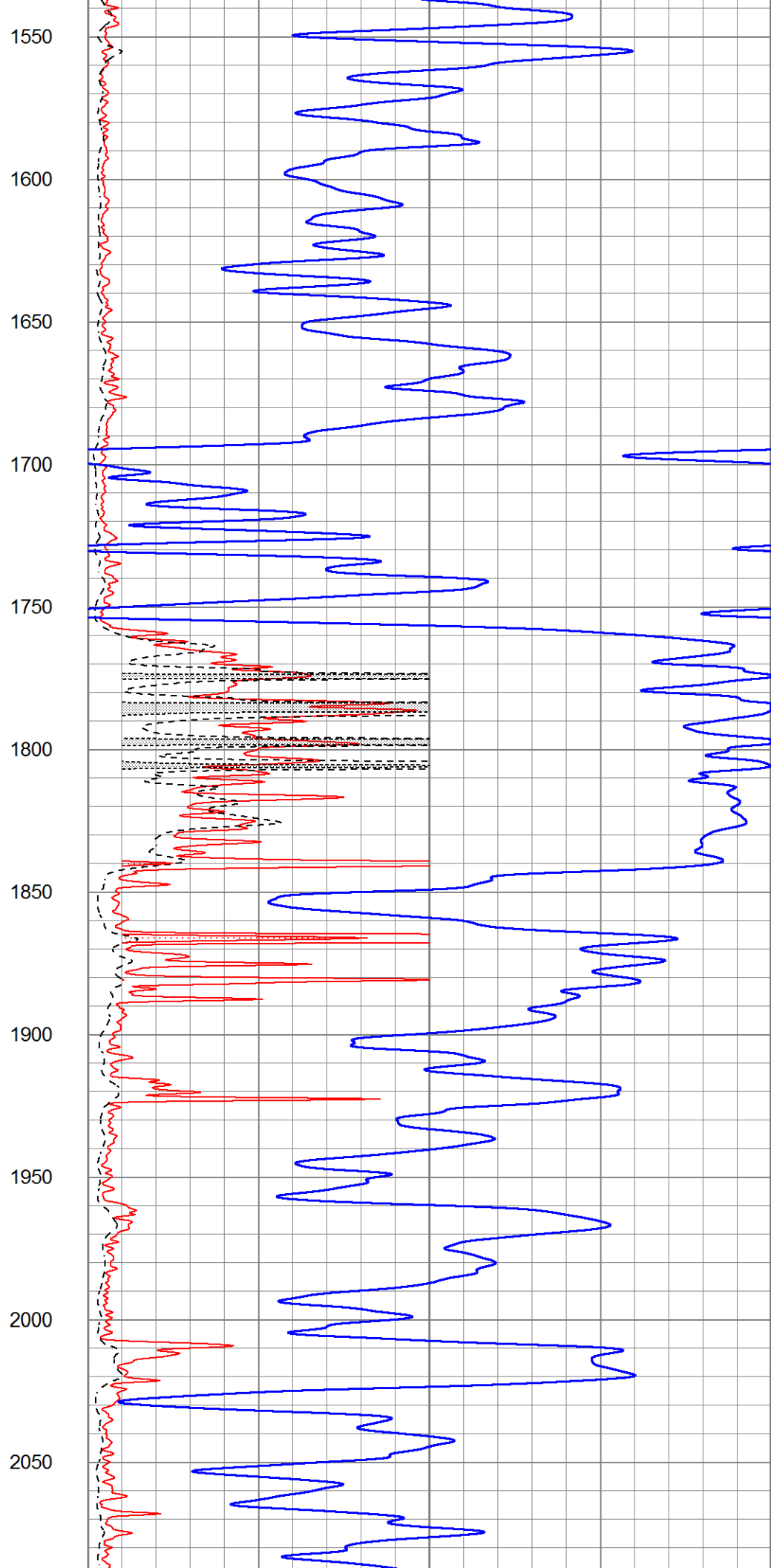
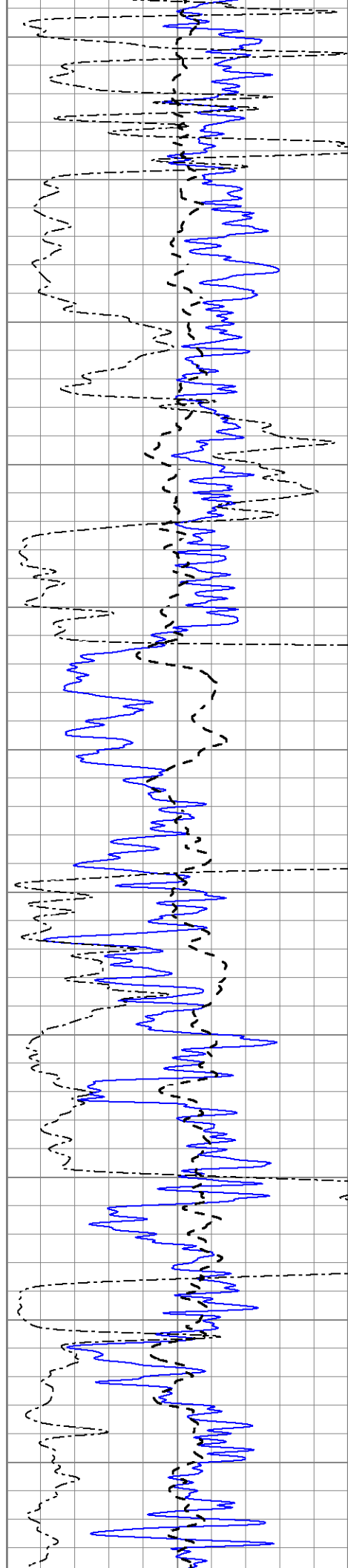
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500
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600
650
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750
800
850
900
950

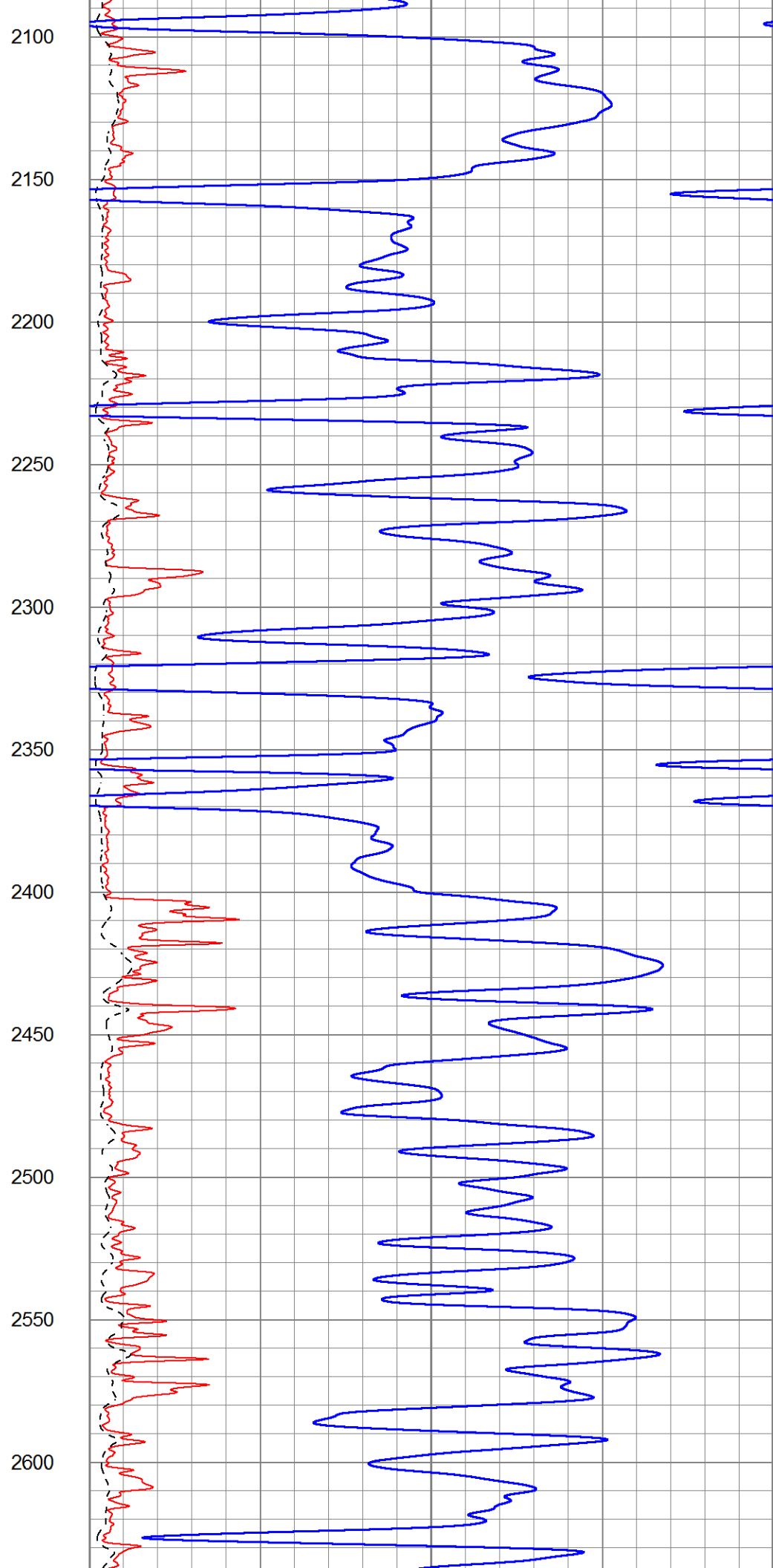
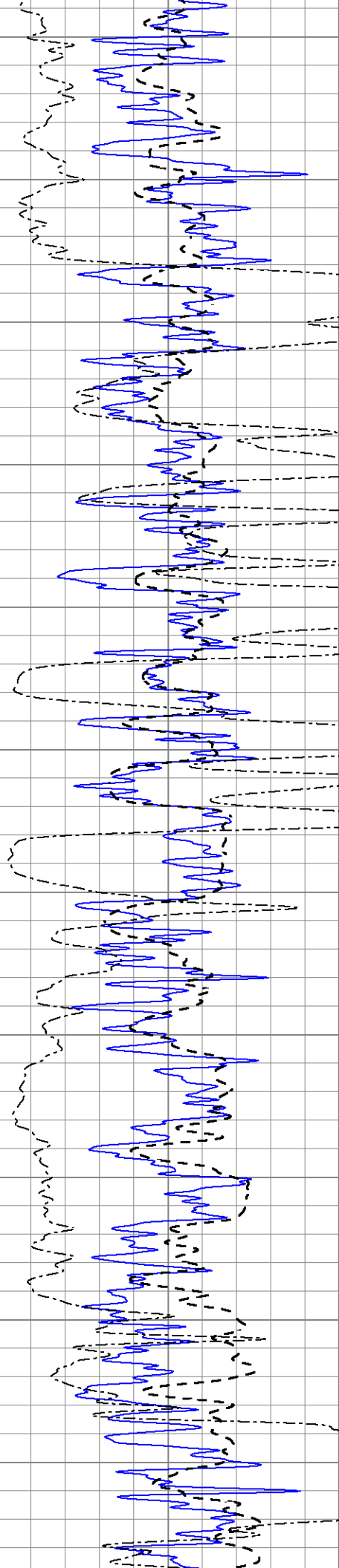


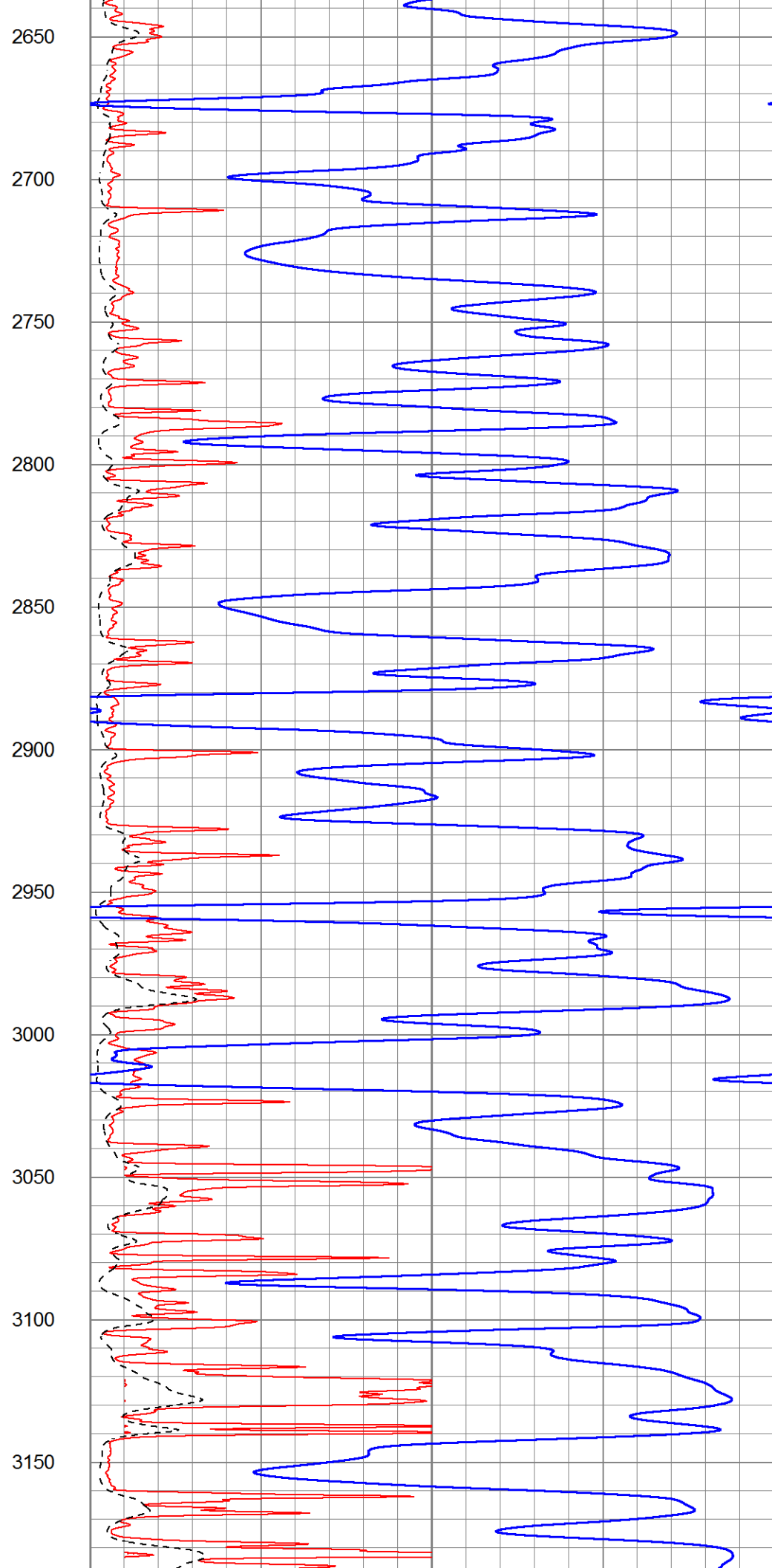
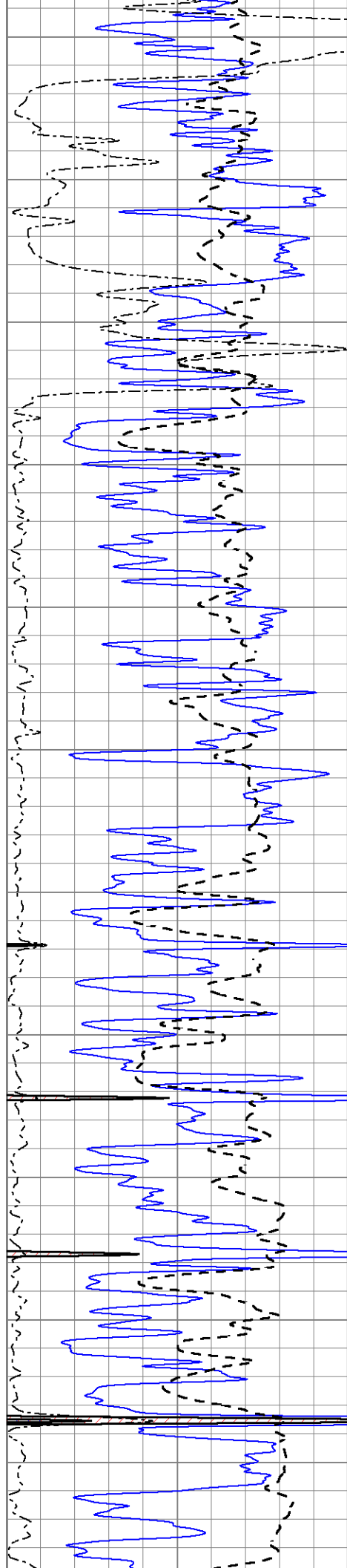


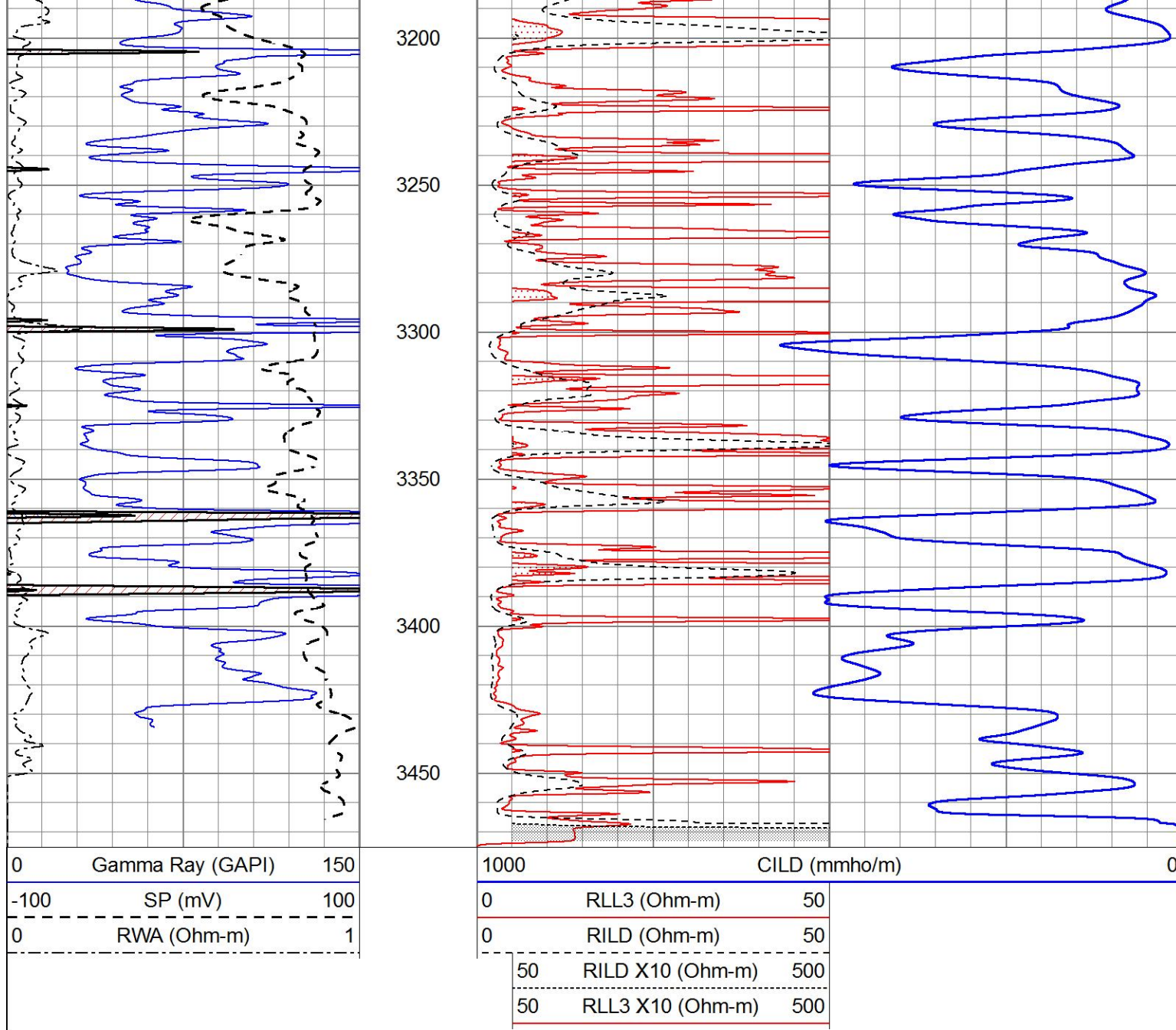
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500







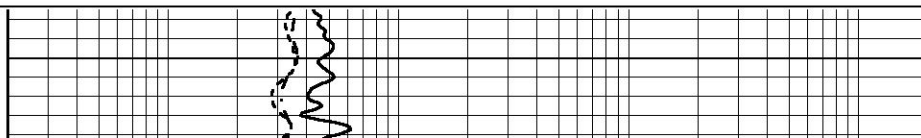
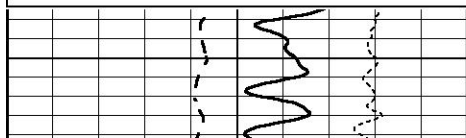


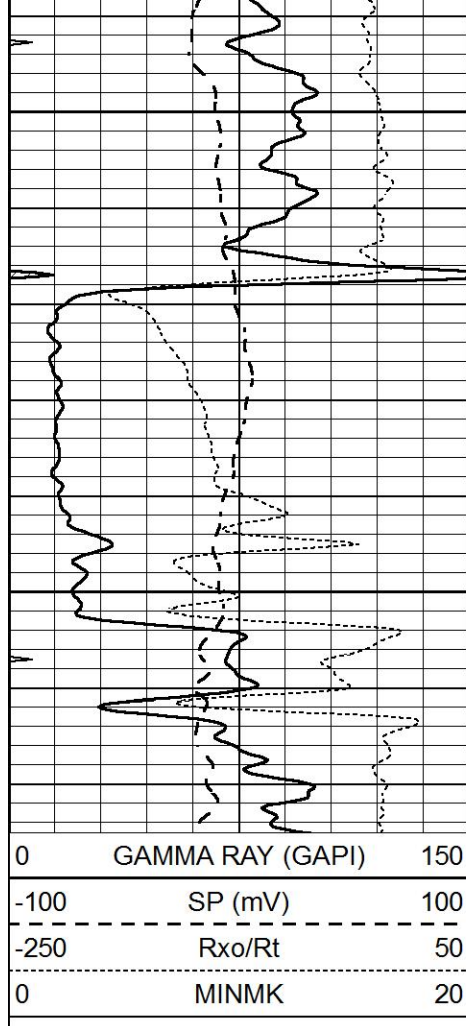


ANHYDRITE

Database File 7319ddn.db
 Dataset Pathname pass3.1A
 Presentation Format _dil
 Dataset Creation Tue Aug 15 13:47:55 2023
 Charted by Depth in Feet scaled 1:240

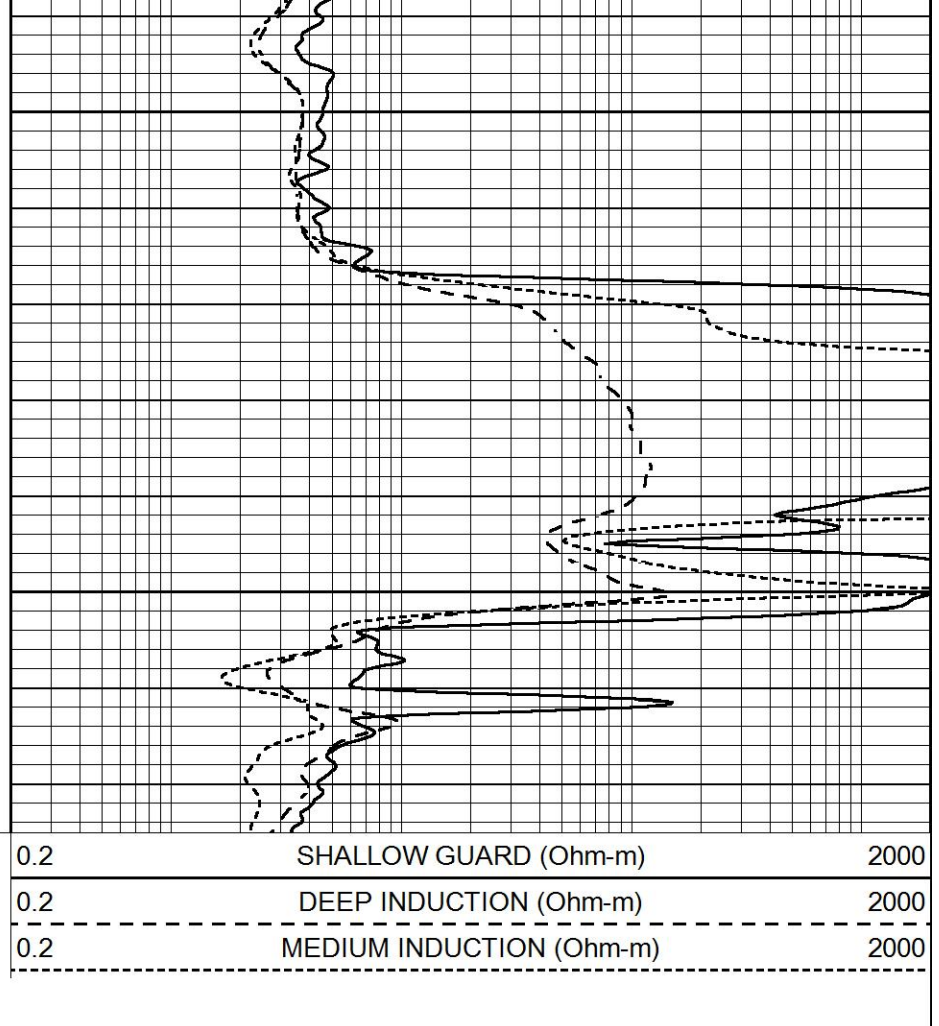
0	GAMMA RAY (GAPI)	150	0.2	SHALLOW GUARD (Ohm-m)	2000
-100	SP (mV)	100	0.2	DEEP INDUCTION (Ohm-m)	2000
-250	Rxo/Rt	50	0.2	MEDIUM INDUCTION (Ohm-m)	2000
0	MINMK	20			





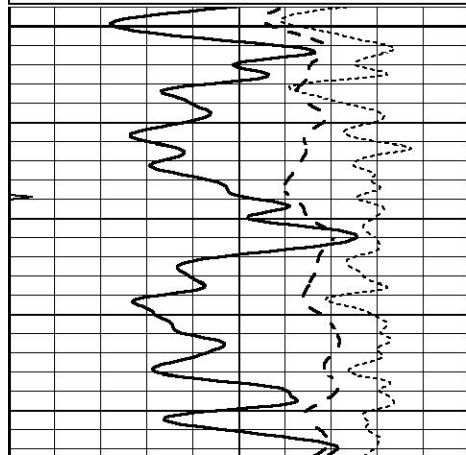
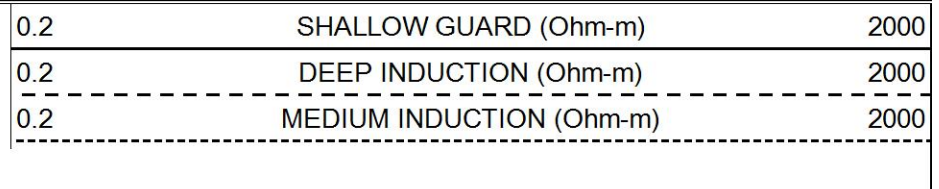
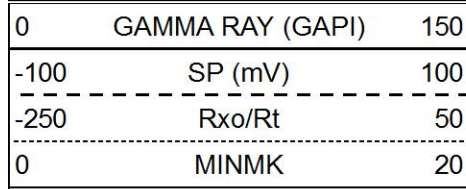
1400

1450

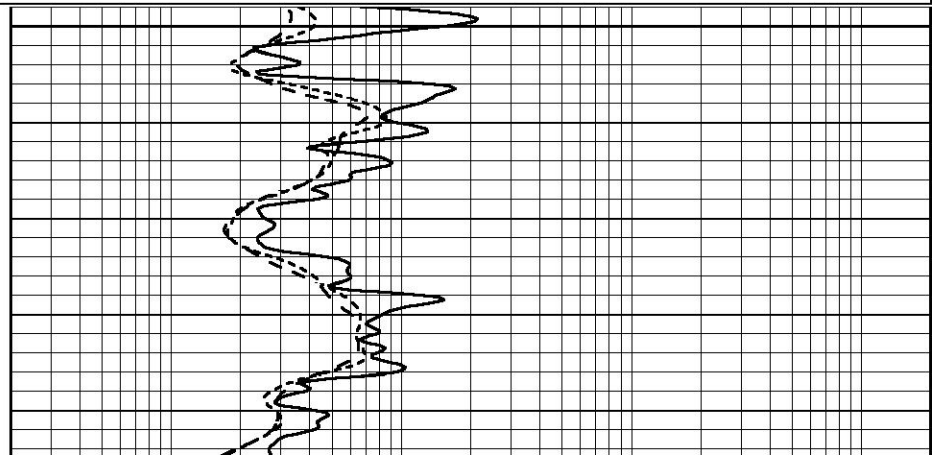


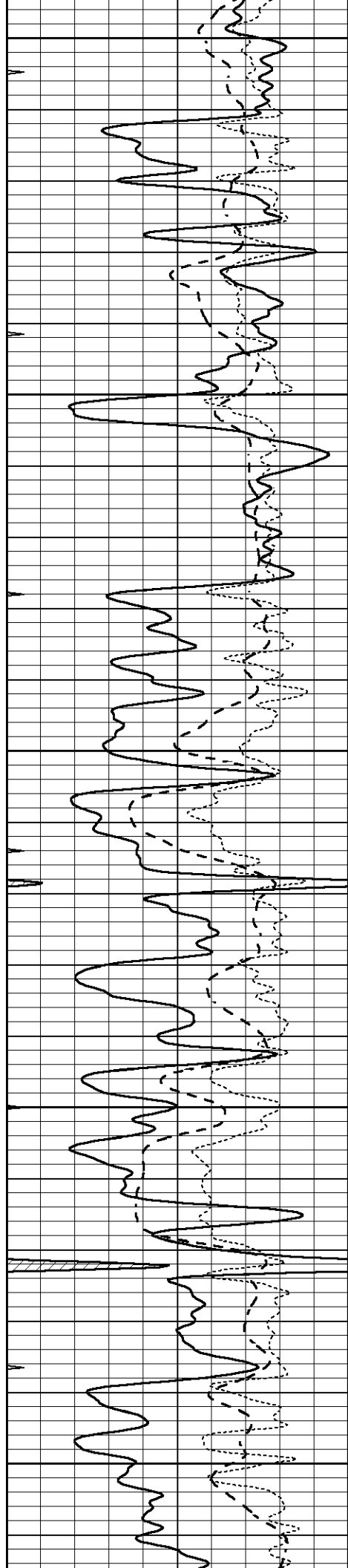
MAIN SECTION

Database File 7319ddn.db
 Dataset Pathname pass3.1M
 Presentation Format _dil
 Dataset Creation Tue Aug 15 13:47:33 2023
 Charted by Depth in Feet scaled 1:240



2800





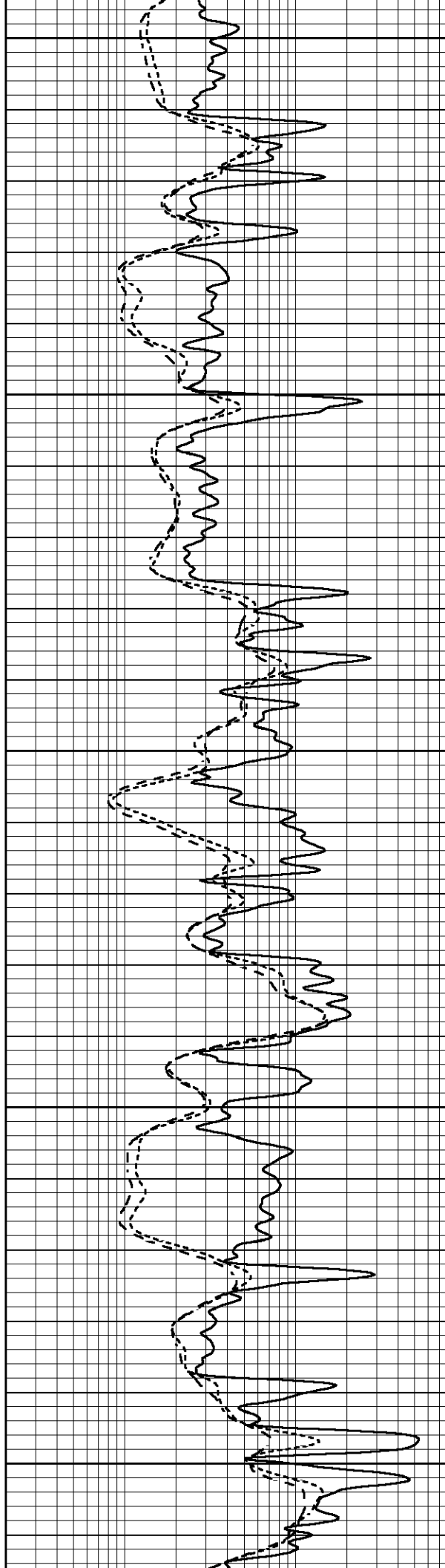
2850

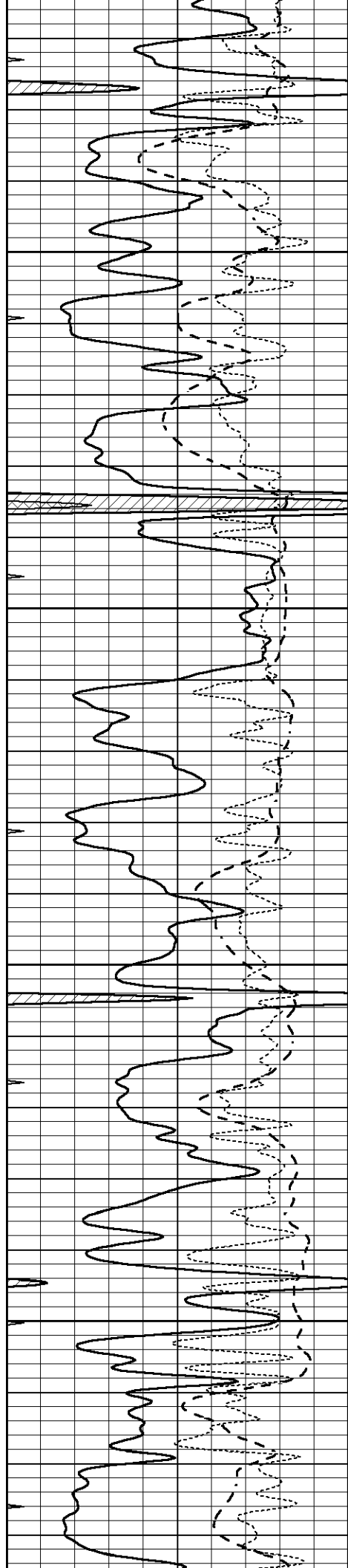
2900

2950

3000

3050



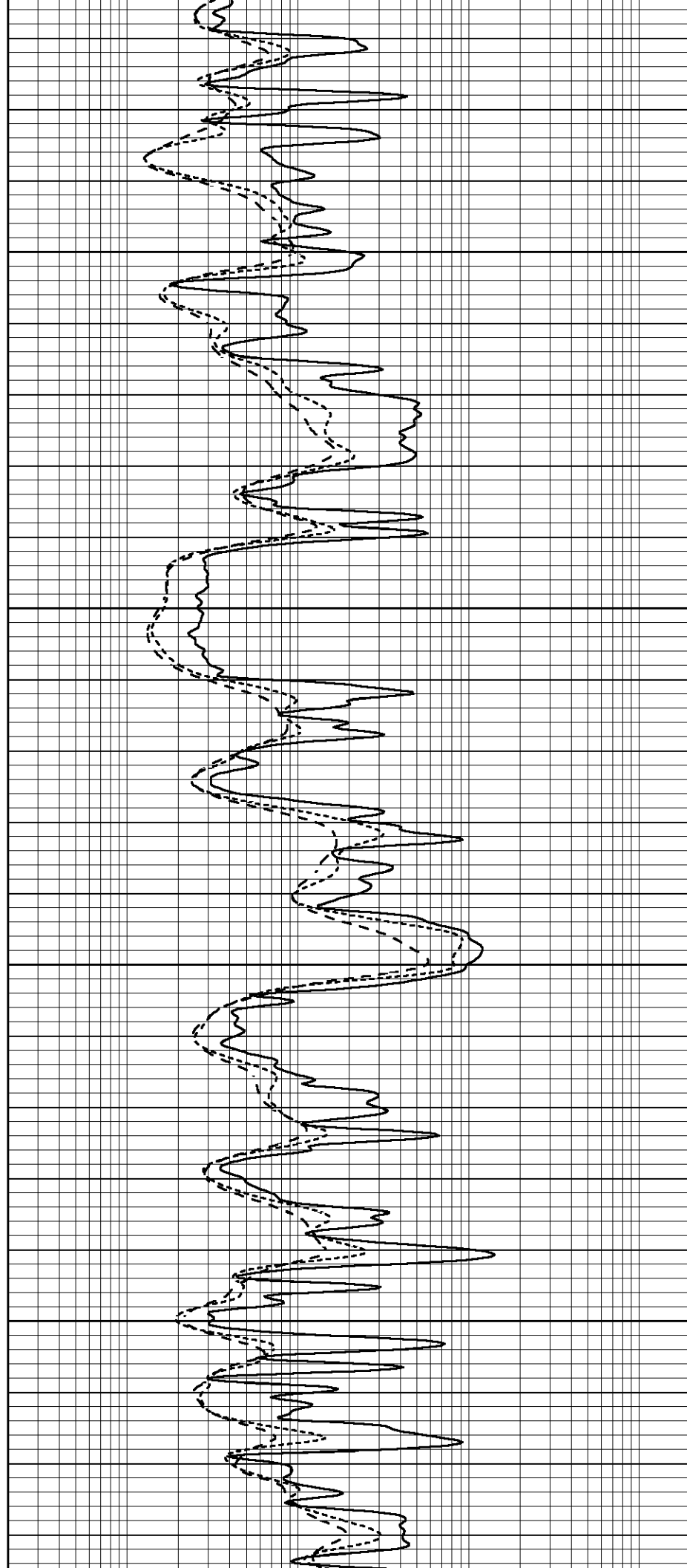


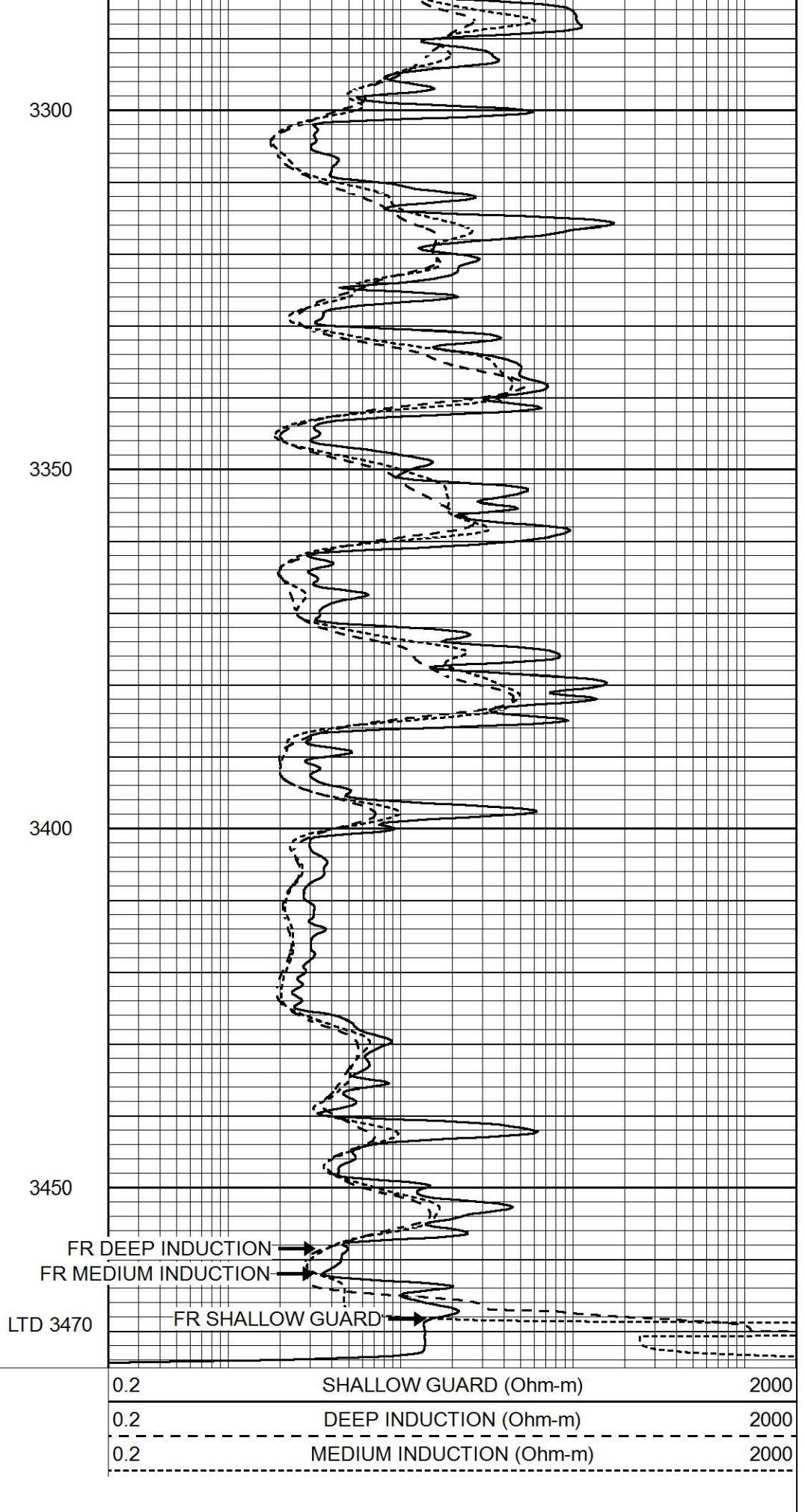
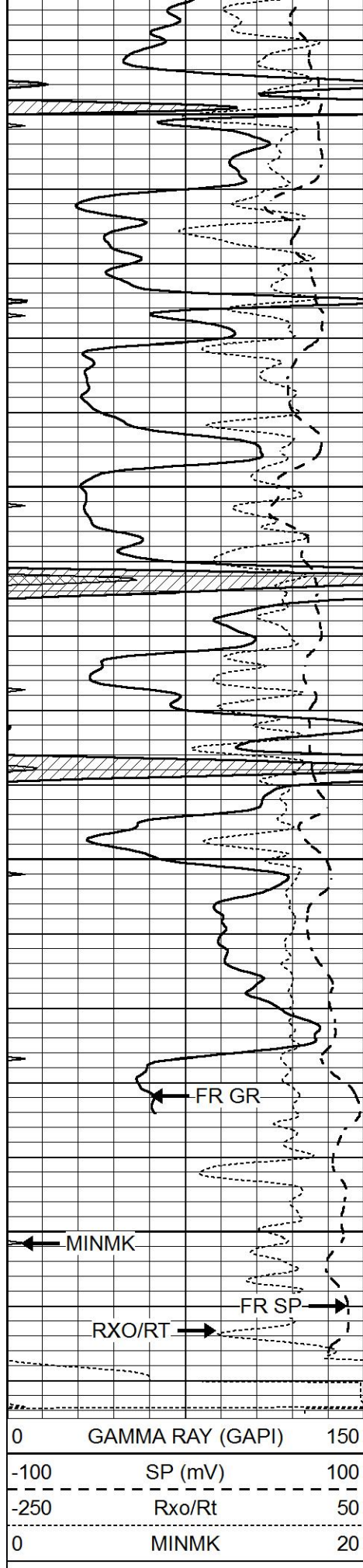
3100

3150

3200

3250





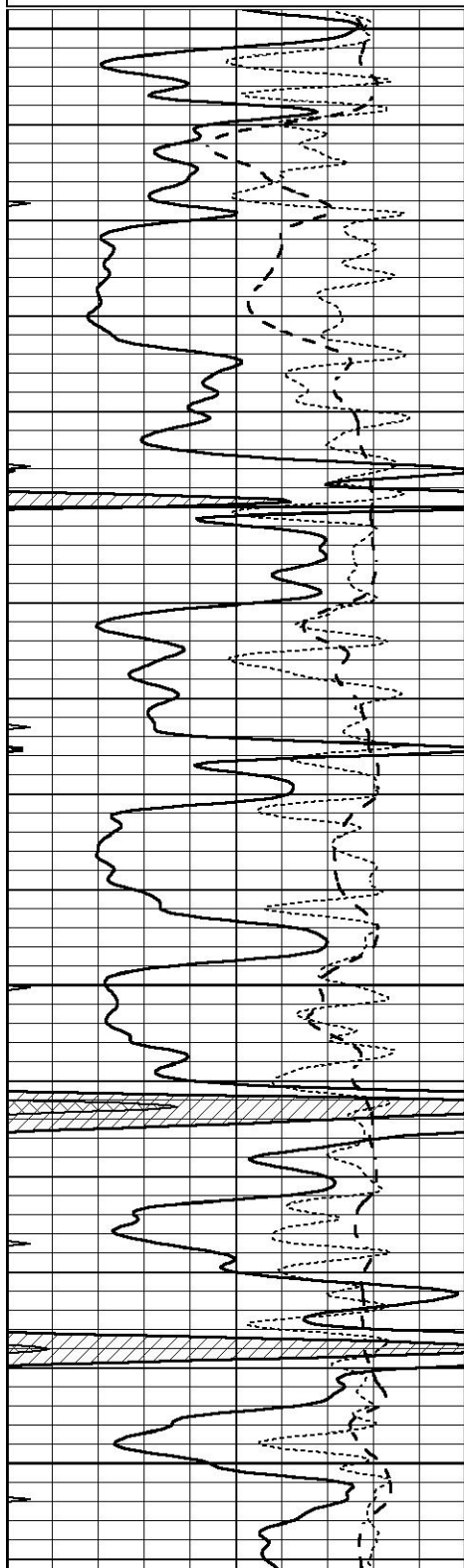


REPEAT SECTION

Database File 7319ddn.db
Dataset Pathname pass2.1R
Presentation Format _dil
Dataset Creation Tue Aug 15 13:16:19 2023
Charted by Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI)	150
-100	SP (mV)	100
-250	Rxo/Rt	50
0	MINMK	20

0.2	SHALLOW GUARD (Ohm-m)	2000
0.2	DEEP INDUCTION (Ohm-m)	2000
0.2	MEDIUM INDUCTION (Ohm-m)	2000

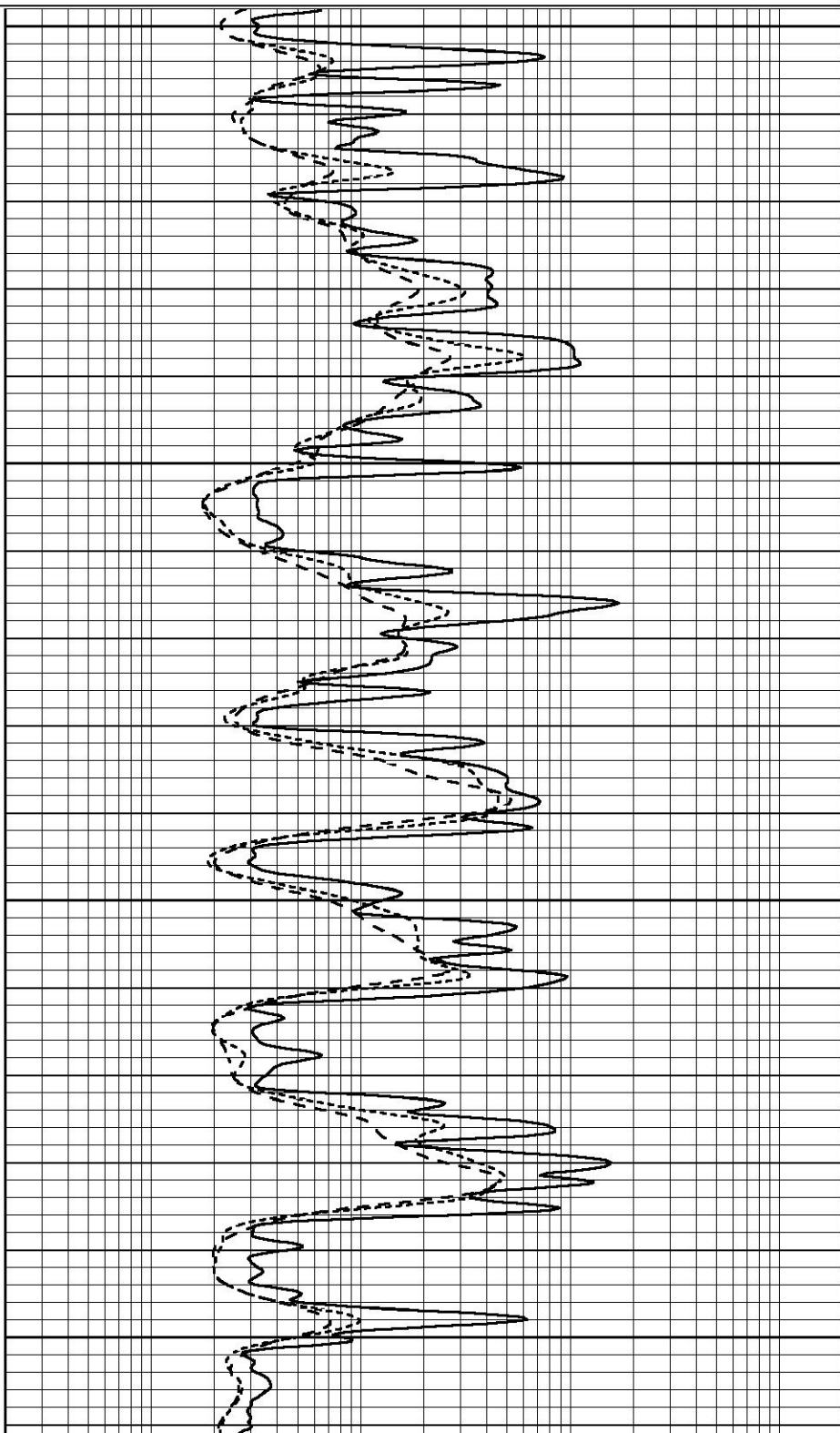


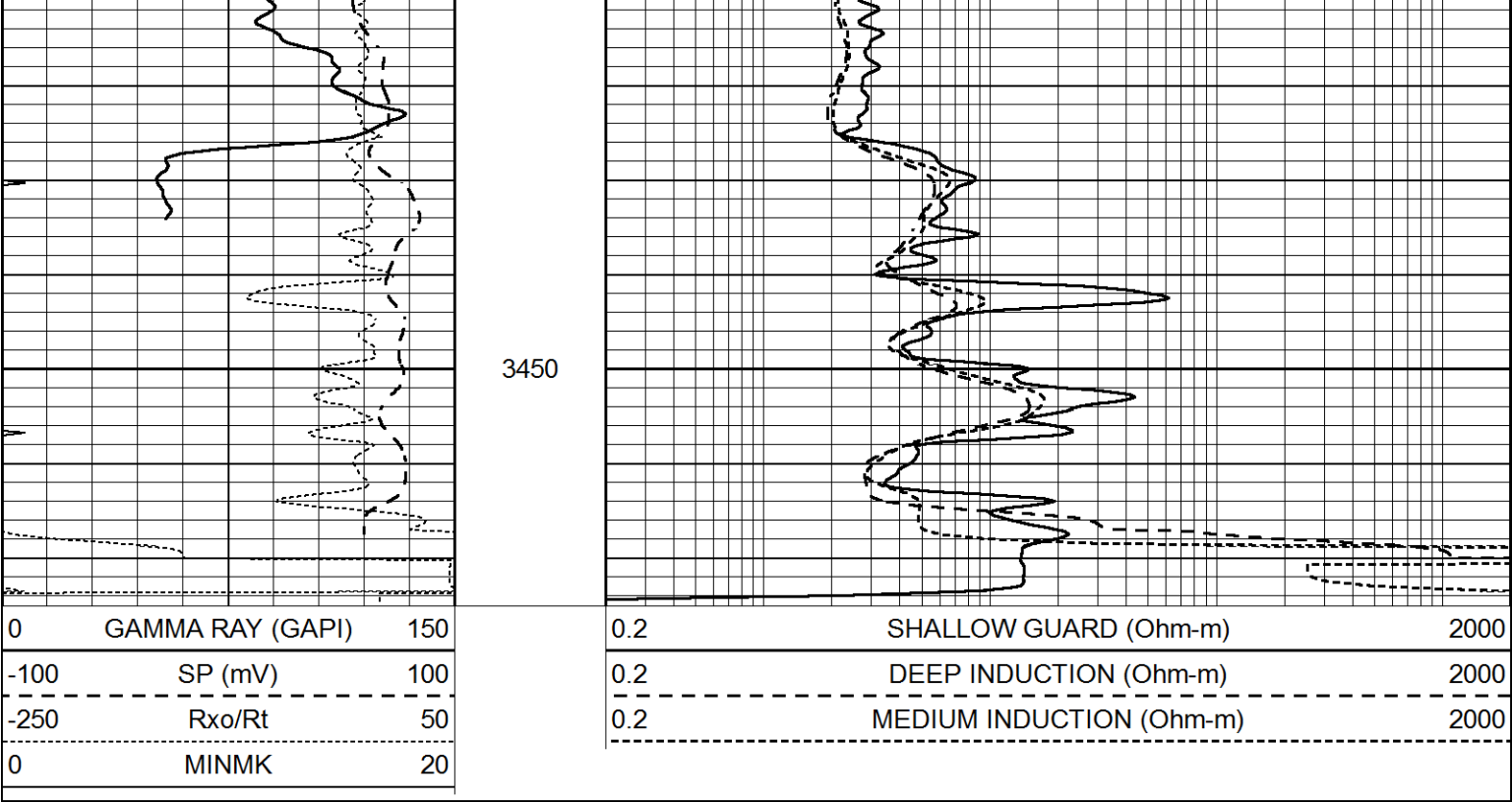
3250

3300

3350

3400





Calibration Report									
Database File	7319ddn.db								
Dataset Pathname	pass3.1M								
Dataset Creation	Tue Aug 15 13:47:33 2023								
Dual Induction Calibration Report									
Serial-Model:					DIL7-GEAR				
Surface Cal Performed:					Sat Aug 05 01:43:07 2023				
Downhole Cal Performed:					Tue Apr 17 15:38:44 2007				
After Survey Verification Performed:					Tue Apr 17 15:38:40 2007				
Surface Calibration									
		Readings			References			Results	
Loop:	Air	Loop		Air	Loop		m	b	
Deep	0.019	0.660	V	0.000	400.000	mmho/m	660.000	18.000	
Medium	-0.006	0.655	V	0.000	462.500	mmho/m	720.000	-32.000	
Internal:	Zero	Cal		Zero	Cal		m	b	
Deep	0.010	0.665	V	0.000	400.000	mmho/m	610.018	-5.925	
Medium	0.009	0.655	V	0.000	400.000	mmho/m	618.983	-5.564	
Downhole Calibration									
		Readings			References			Results	
Internal:	Zero	Cal		Zero	Cal		m	b	
Deep	3.372	400.834	mmho/m	0.556	401.206	mmho/m	1.008	-2.843	
Medium	13.557	467.446	mmho/m	9.465	462.114	mmho/m	0.997	-4.055	
Shallow	2.521	0.019	V	500.000	2.000	Ohm-m	225.000	0.000	
After Survey Verification									
		Readings			Targets			Results	

Internal:	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho/m	3.372	400.834	mmho/m	1.008	-2.843
Medium	0.000	0.000	mmho/m	13.557	467.446	mmho/m	0.997	-4.055
Shallow	2.500	0.000	Ohm-m	500.000	2.000	Ohm-m	225.000	0.000
Litho Density Calibration Report Serial: 001 Model: PRB								
Master Calibration			Performed Tue Aug 02 14:54:49 2022					
	Background	Magnesium		Aluminum		Aluminum+Fe		
Window 1	1540.1	9840.1		3279.8		3001.8		cps
Window 2	1435.6	8495.4		2920.3		2720.3		cps
Window 3	1167.4	4527.9		1868.6		1810.1		cps
Window 4	344.6	343.5		346.7		342.3		cps
Long Space	0.0	7059.8		1484.8		1284.7		cps
Short Space	3.3	2502.7		1618.3		1368.5		cps
Rho		1.7100		2.5900		0.0000		g/cc
Pe		2.0000		2.7500		5.7900		
Rib Angle	: 44.4	Rib Slope	: 0.979	Density/Spine Ratio			: 0.544	
Spine Angle	: 74.4	Spine Slope	: 3.576	Spine Intercept			: -19.1	
Before Survey Verification			Performed Wed Dec 31 18:00:00 1969					
Window 1	0.0	0.0		0.0		0.0		cps
Window 2	0.0	0.0		0.0		0.0		cps
Window 3	0.0	0.0		0.0		0.0		cps
Window 4	0.0	0.0		0.0		0.0		cps
Long Space	0.0	0.0		0.0		0.0		cps
Short Space	0.0	0.0		0.0		0.0		cps
Measured Rho		0.0000		0.0000		0.0000		g/cc
Measured Correction		0.0000		0.0000		0.0000		g/cc
Measured Pe				0.0000		0.0000		
After Survey Verification			Performed Wed Dec 31 18:00:00 1969					
Window 1	0.0	0.0		0.0		0.0		cps
Window 2	0.0	0.0		0.0		0.0		cps
Window 3	0.0	0.0		0.0		0.0		cps
Window 4	0.0	0.0		0.0		0.0		cps
Long Space	0.0	0.0		0.0		0.0		cps
Short Space	0.0	0.0		0.0		0.0		cps
Measured Rho		0.0000		0.0000		0.0000		g/cc
Measured Correction		0.0000		0.0000		0.0000		g/cc
Measured Pe				0.0000		0.0000		
Compensated Neutron Calibration Report								
			Serial Number:		070808PMC			
			Tool Model:		NABORS			
PRE-SURVEY VERIFICATION								
Detector		Readings		Measured		Target		
Short Space		cps						
Long Space		cps		pu		pu		

POST-SURVEY VERIFICATION			
Detector	Readings	Measured	Target
Short Space	cps		
Long Space	cps	pu	pu
Gamma Ray Calibration Report			
Serial Number:	070558		
Tool Model:	OPEN_GR		
Performed:	Mon Aug 14 04:12:15 2023		
Calibrator Value:	1.0	GAPI	
Background Reading:	0.0	cps	
Calibrator Reading:	1.0	cps	
Sensitivity:	0.3000	GAPI/cps	