

HALLIBURTON

**DUAL SPACED NEUTRON
SPECTRAL DENSITY
ARRAY COMPENSATED
TRUE RESISTIVITY**

COMPANY		WELL		FIELD/BLOCK		COUNTY		STATE	
PIONEER NATURAL RESOURCES USA INC.		HARMON 42-6-17-53		WILDCAT		LINCOLN		CO	
COMPANY		WELL		FIELD/BLOCK		COUNTY		STATE	
PIONEER NATURAL RESOURCES USA INC.		HARMON 42-6-17-53		WILDCAT		LINCOLN		CO	
API No.		Location		LATITUDE:		LONGITUDE:		Other Services:	
05073066150000		SHL: 2293' FNL & 667' FEL SENE		38.604222		-103.377606		CSNG WSTT XRMI	
Sect. 6		Twp. 17S		Rge. 53W					
Permanent Datum		Log measured from		Drilling measured from					
GL		KB		KB				Elev. 4655.0 ft	
Date		31-Jul-14						D.F. 4681.0 ft	
Run No.		ONE						G.L. 4655.0 ft	
Depth - Driller		6690.00 ft							
Depth - Logger		6584.0 ft							
Bottom - Logged Interval		6582 ft							
Top - Logged Interval		100 ft							
Casing - Driller		9.625 in		@ 3050.0 ft				@	
Casing - Logger		3040.0 ft							
Bit Size		7.875 in						@	
Type Fluid in Hole		Water Based Mud							
Density		8.6 ppg		37.00 s/qt					
PH		8.70 pH		10.0 cp/m					
Source of Sample		MEASURED							
Rm @ Meas. Temperature		1.51 ohmm		@ 79.40 degF				@	
Rmf @ Meas. Temperature		1.55 ohmm		@ 73.80 degF				@	
Rmc @ Meas. Temperature		2.220 ohmm		@ 73.00 degF				@	
Source Rmf		MEASURED							
Rm @ BHT		0.77 ohmm		@ 161.5 degF				@	
Time Since Circulation		14.0000 hr							
Time on Bottom		31-Jul-14 09:47							
Max. Rec. Temperature		161.5 degF		@				@	
Equipment		11454566		BRIGHTON CC					
Recorded By		J. SCHMIDT							
Witnessed By		W. CAMPAGN		T. BEARDSLEE					

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Service Ticket No.: 901534961				API Serial No.: 05073066150000				PGM Version: WL INSITE R4.2.0 (Build 2)			
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE						RESISTIVITY SCALE CHANGES					
Date	Sample No.					Type Log	Depth	Scale Up Hole	Scale Down Hole		
Depth-Driller											
Type Fluid in Hole											
Density	Viscosity										
Ph	Fluid Loss										
Source of Sample						RESISTIVITY EQUIPMENT DATA					
Rm @ Meas. Temp	@			@		Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other	
Rmf @ Meas. Temp.	@			@		ONE	ACRT	N/A	0.5" S.O.	N/A	
Rmc @ Meas. Temp.	@			@			11296758				
Source Rmf	Rmc						11294352				
Rm @ BHT	@			@							
Rmf @ BHT	@			@							
Rmc @ BHT	@			@							
EQUIPMENT DATA											
GAMMA			ACOUSTIC			DENSITY			NEUTRON		
Run No.	ONE		Run No.			Run No.	ONE		Run No.	ONE	
Serial No.	11812882		Serial No.			Serial No.	11045470		Serial No.	11301132	
Model No.	GTET		Model No.			Model No.	SDLT		Model No.	DSNT	
Diameter	3.625"		No. of Cent.			Diameter	4.5"		Diameter	3.625"	
Detector Model No.	GTET		Spacing			Log Type	GAM-GAM		Log Type	NEU-NEU	
Type	SCINT					Source Type	Cs-137		Source Type	Am241Be	
Length	8"		LSA [Y/N]			Serial No.	5471GW		Serial No.	DSN-434	
Distance to Source	18'		FWDA [Y/N]			Strength	1.78 Ci		Strength	15 Ci	

LOGGING DATA

GENERAL			GAMMA		ACOUSTIC			DENSITY			NEUTRON			
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	TD	100'	REC	0	200				1.95g/cc	2.95g/cc	2.71 g/cc	0.45	-0.15	LIME
DIRECTIONAL INFORMATION														
Maximum Deviation @								KOP @						
Remarks: RUN1: RWCH/GTET/CSNG/DSNT/SDLT/ACRT/TEMP SUB RAN IN COMBINATION														
TENSION PULLS, WASHOUTS, AND BOREHOLE RUGOSITY CAN EFFECT TOOL RESPONSE AND REPEATABILITY														
ANNULAR HOLE VOLUME CALCULATED USING 5.5-INCH CASING														
BOTTOM HOLE TEMP WAS AVERAGED FROM TWO DOWNHOLE THERMOMETERS 161 & 162														
YOUR CREW: J. CAWOOD, R. DAVIS, J. WILKERSON, J. ARELLANO														
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES - BRIGHTON, CO - (303)-825-4346														
HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.														
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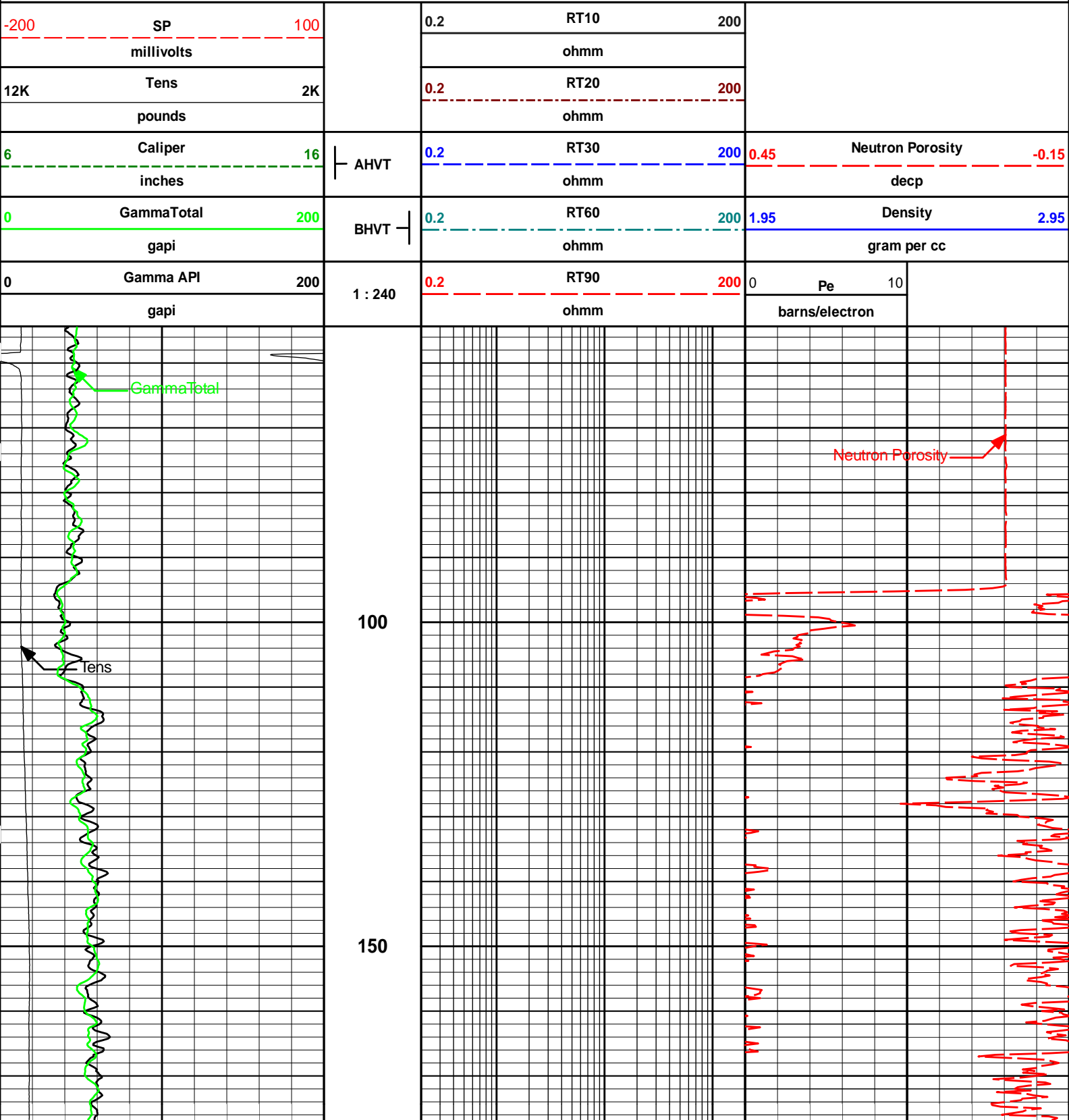
PARAMETERS REPORT

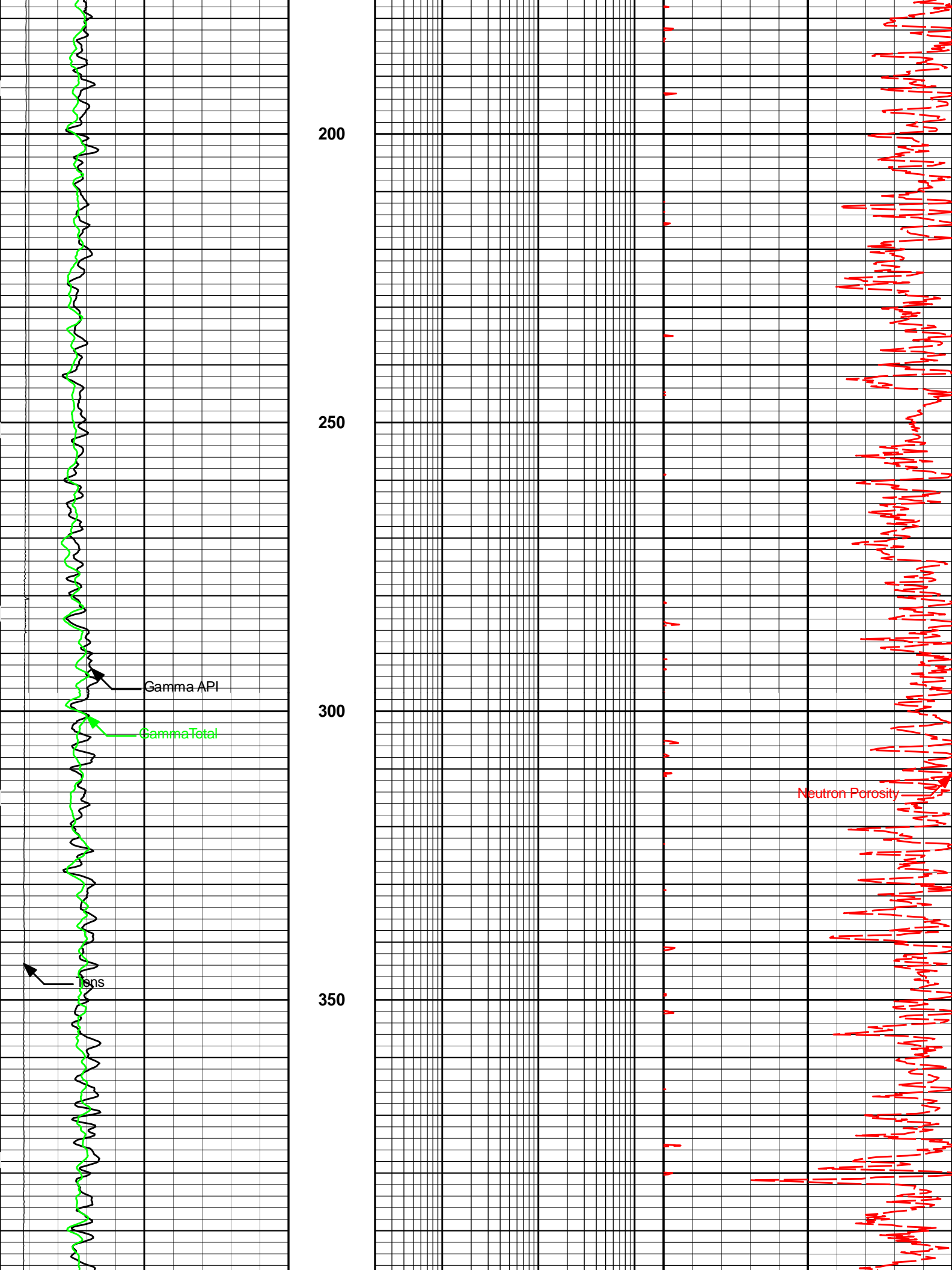
Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	BS	Bit Size	7.875	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	8.600	ppg
	SHARED	WAGT	Weighting Agent	Barite	
	SHARED	BSAL	Borehole salinity	800.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	1.510	ohmm
	SHARED	TRM	Temperature of Mud	79.4	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	5.500	in
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	6584.00	ft
	SHARED	BHT	Bottom Hole Temperature	162.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	Temperature Master Tool	NONE	
	Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
	Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
	Rwa / CrossPlot	AFAC	Archie A factor	0.6200	

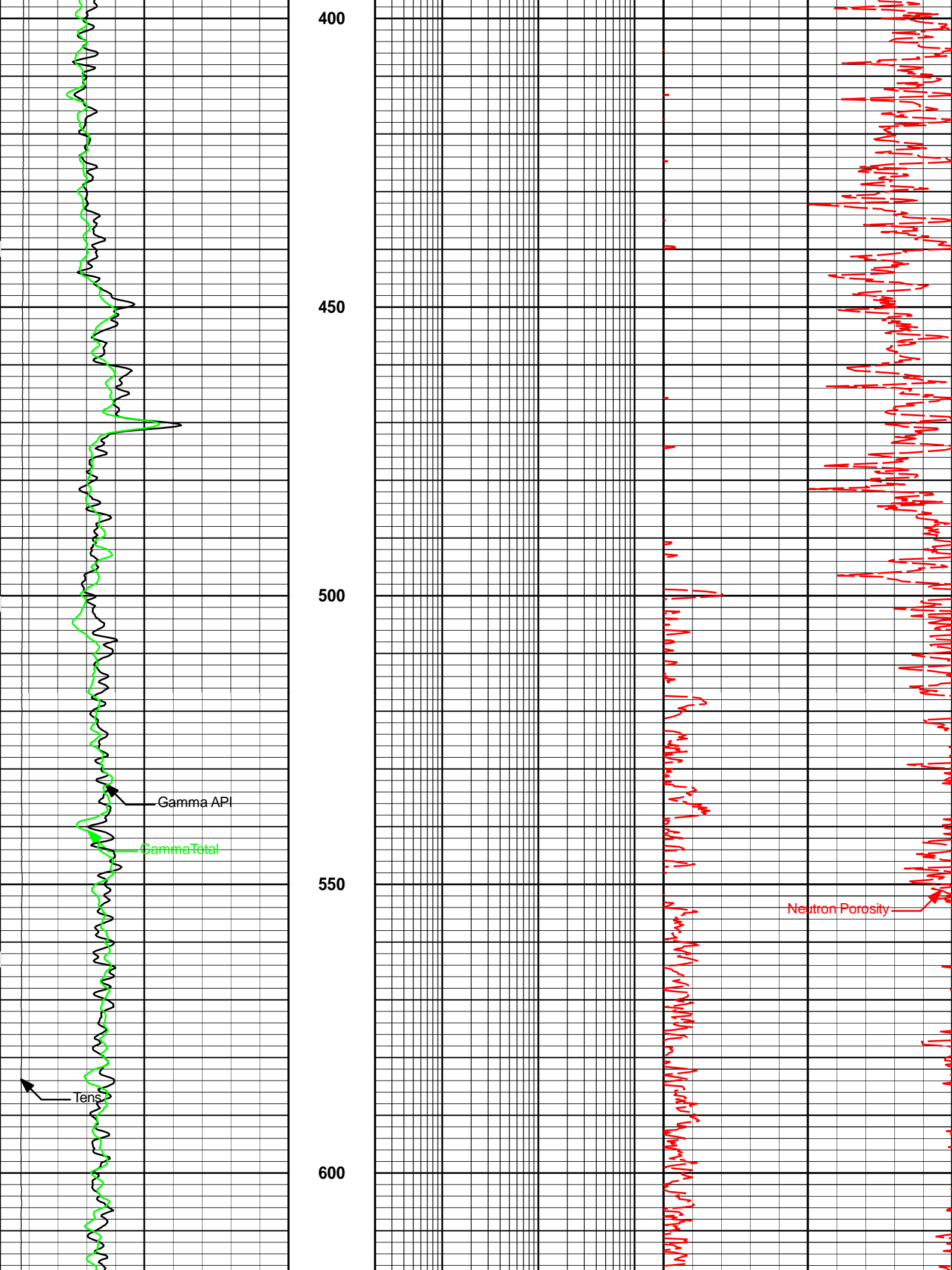
Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
Rwa / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
Rwa / CrossPlot	BHSM	Borehole Size Source Tool	SDLT	
GTET	GROK	Process Gamma Ray?	Yes	
GTET	GRSO	Gamma Tool Standoff	0.000	in
GTET	GEOK	Process Gamma Ray EVR?	No	
GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
GTET	BHSM	Borehole Size Source Tool	SDLT	
CSNG	CGOK	Process CSNG Data?	Yes	
CSNG	CENT	Is Tool Centralized?	No	
CSNG	GBOK	Gamma Enviromental Corrections?	Yes	
CSNG	BARF	Barite Correction Factor	1.00	
CSNG	ORDG	Use Fixed Gain	No	
CSNG	ORDO	Use Fixed Offset	No	
CSNG	ORDR	Use Fixed Resolution Degradation Factor	No	
CSNG	BHSM	Borehole Size Source Tool	SDLT	
DSNT	DNOK	Process DSN?	Yes	
DSNT	DEOK	Process DSN EVR?	No	
DSNT	NLIT	Neutron Lithology	Limestone	
DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
DSNT	DNTP	Temperature Correction Type	None	
DSNT	DPRS	DSN Pressure Correction Type	None	
DSNT	SHCO	View More Correction Options	No	
DSNT	UTVD	Use TVD for Gradient Corrections?	No	
DSNT	LHWT	Logging Horizontal Water Tank?	No	
DSNT	BHSM	Borehole Size Source Tool	SDLT	
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT Pad	DNOK	Process Density?	Yes	
SDLT Pad	DNOK	Process Density EVR?	No	
SDLT Pad	CB	Logging Calibration Blocks?	No	
SDLT Pad	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT Pad	DTWN	Disable temperature warning	No	
SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
SDLT Pad	BHSM	Borehole Size Source Tool	SDLT	
Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	0.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Up	
ACRt Sonde	TPOS	Tool Position	Eccentered	
ACRt Sonde	RMOP	Rmud Source	Mud Cell	
ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt Sonde	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm
ACRt Sonde	BHSM	Borehole Size Source Tool	SDLT	

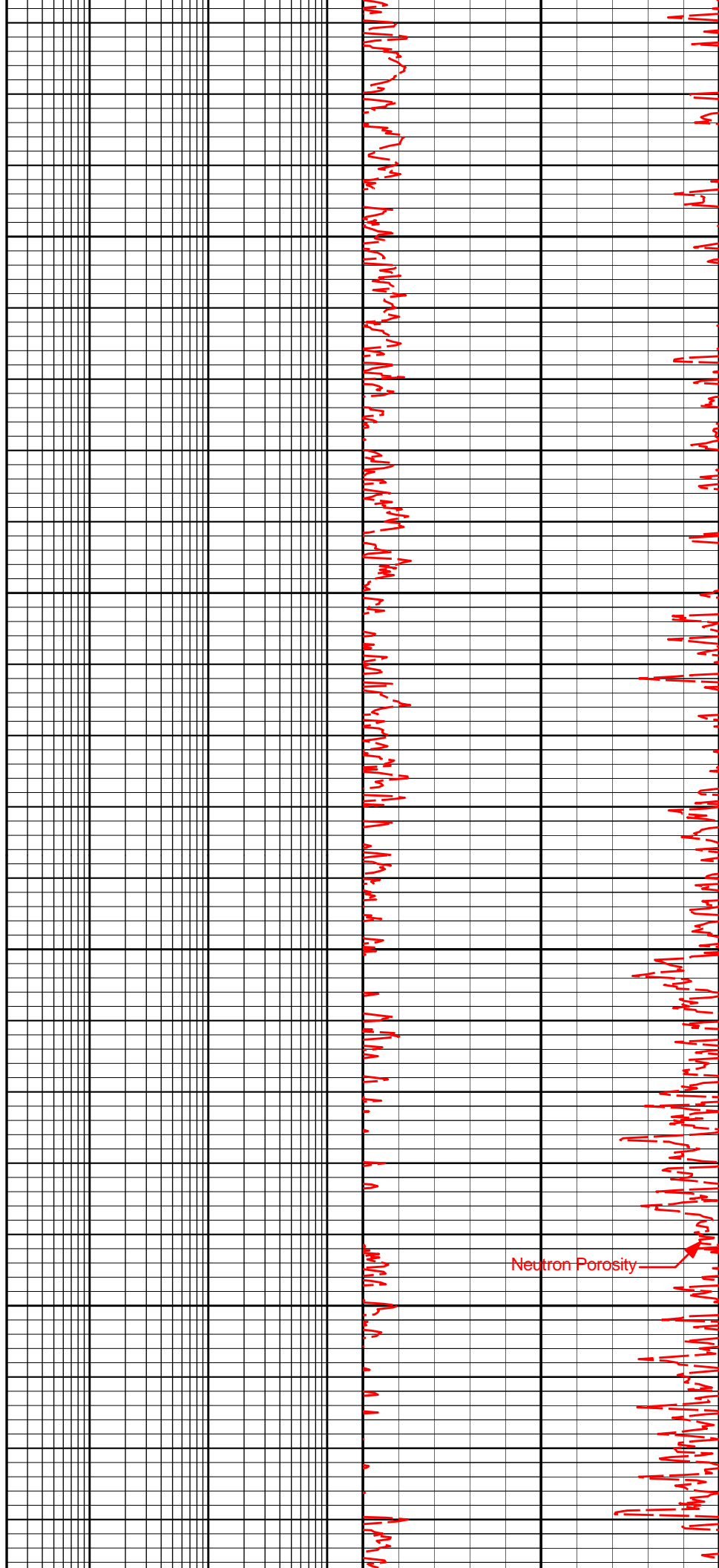
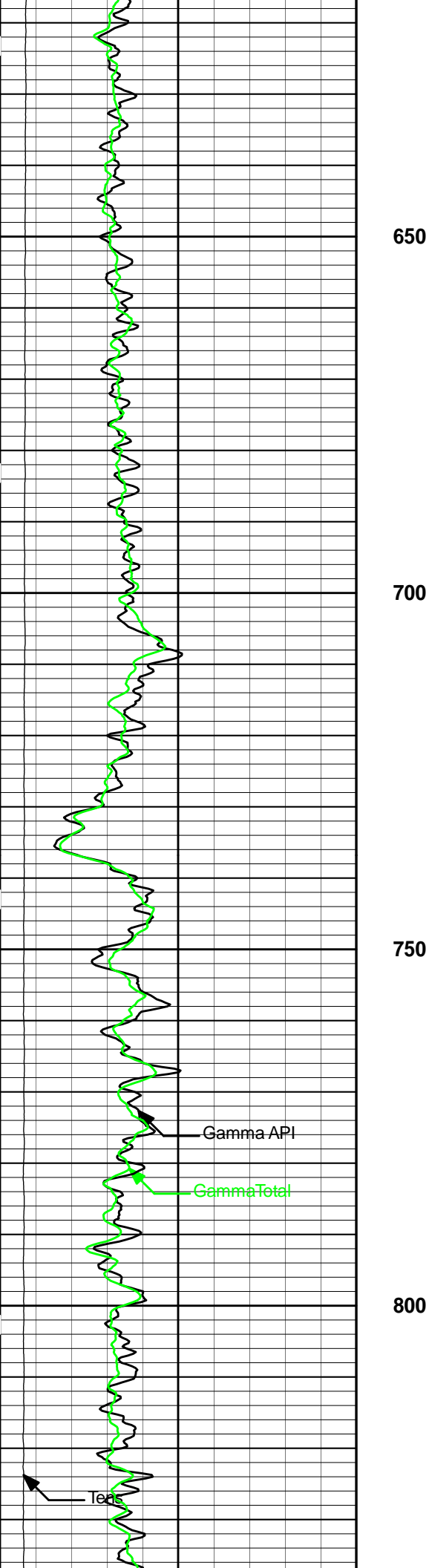
BOTTOM

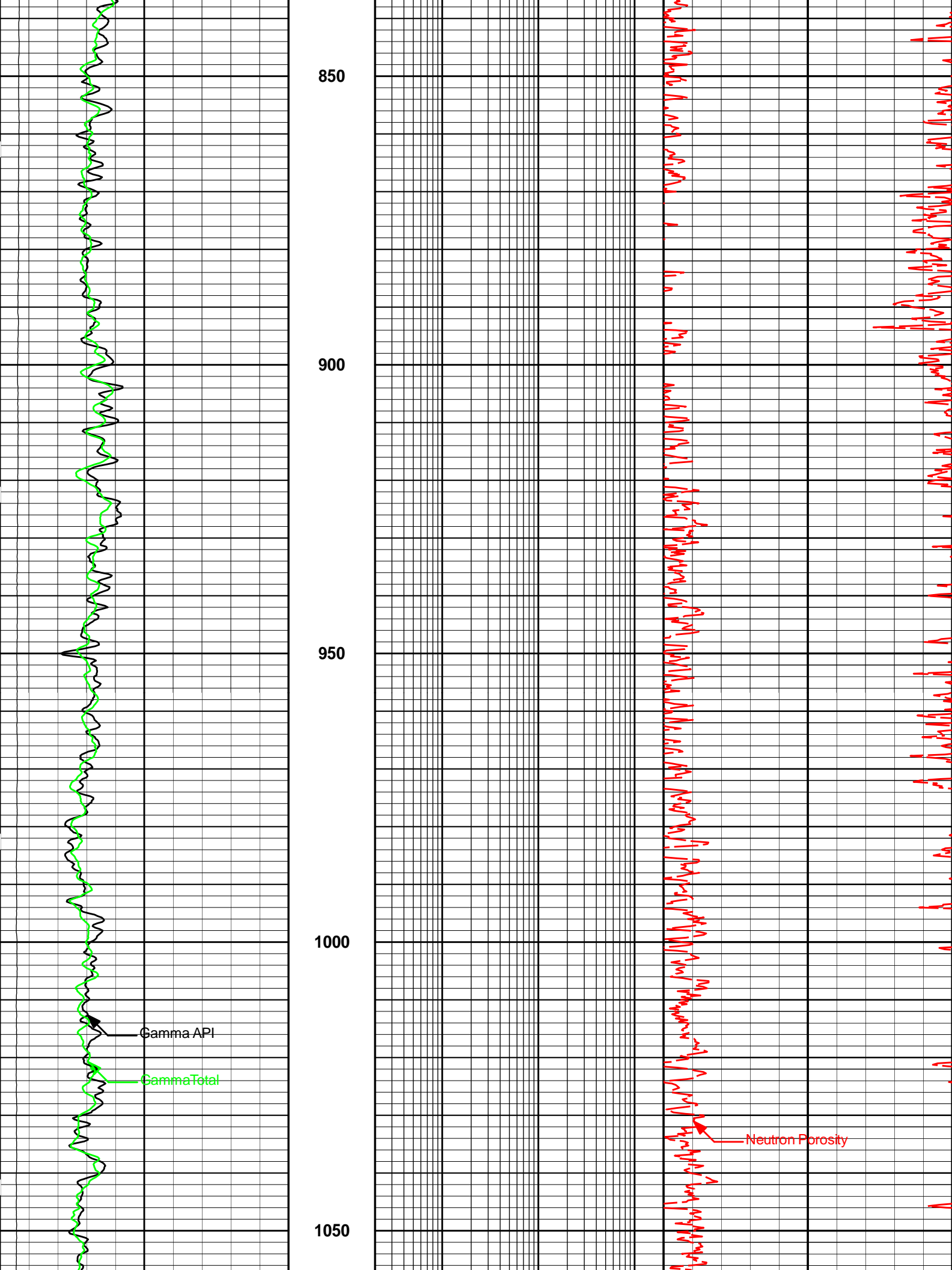
MAIN PASS 5" = 100'

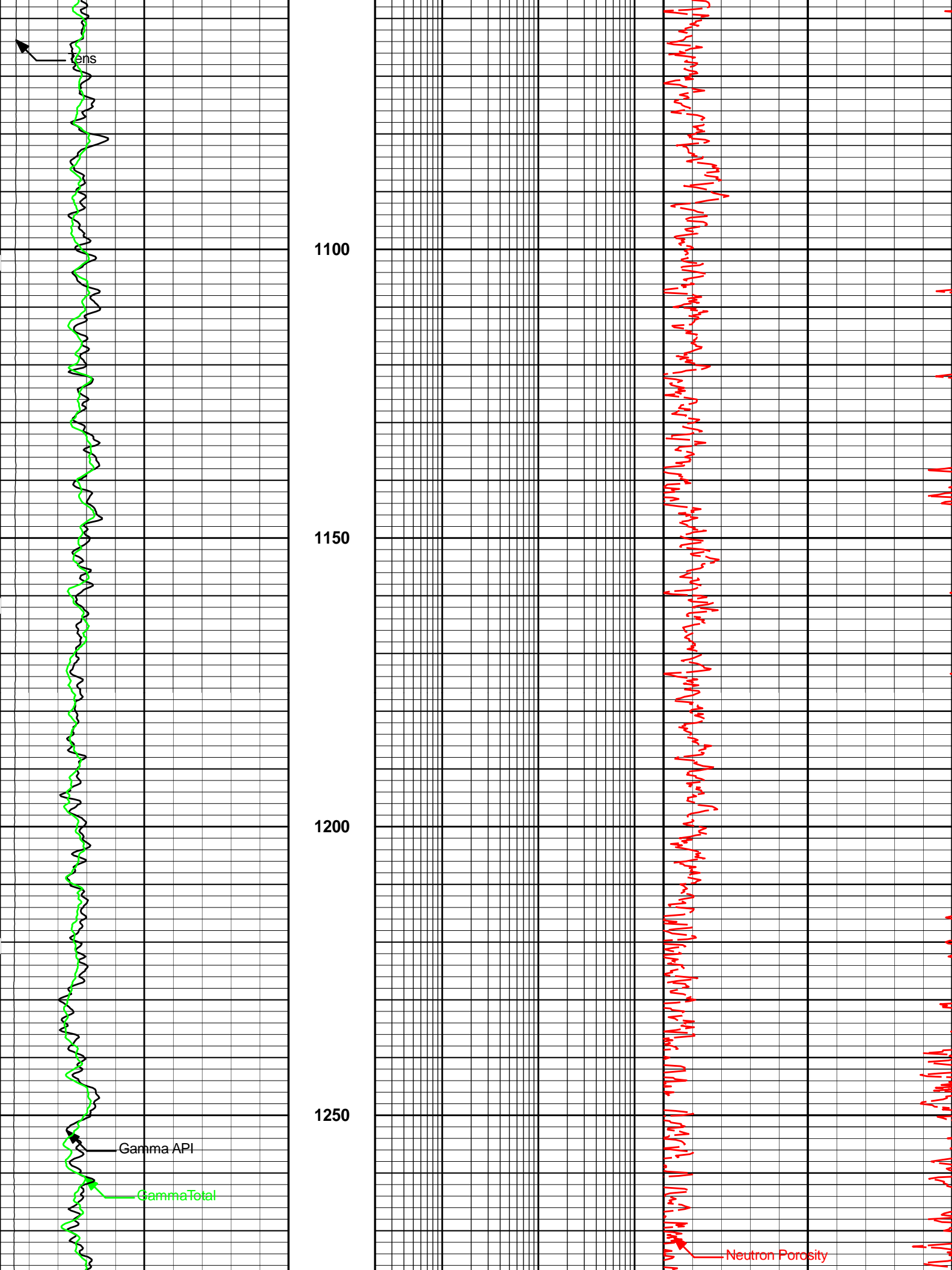


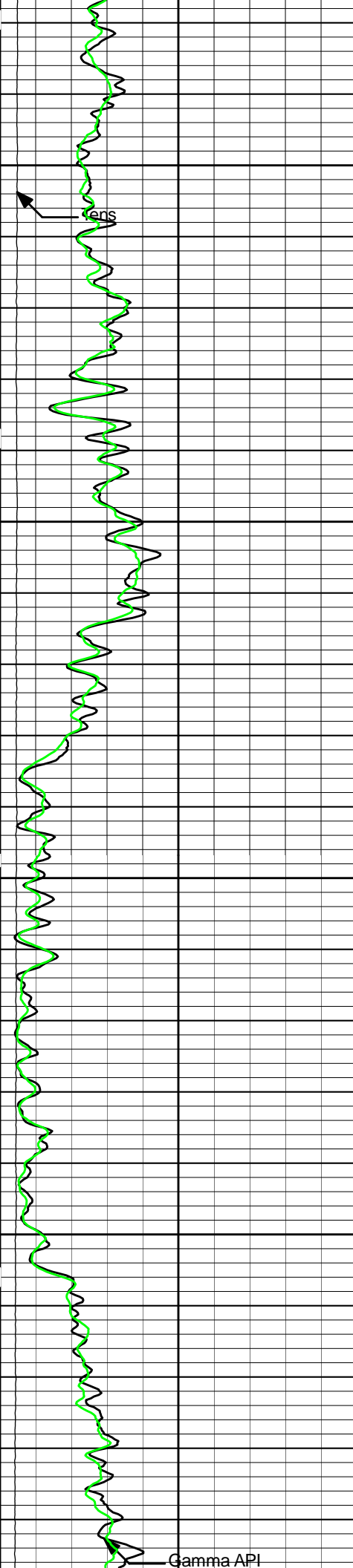










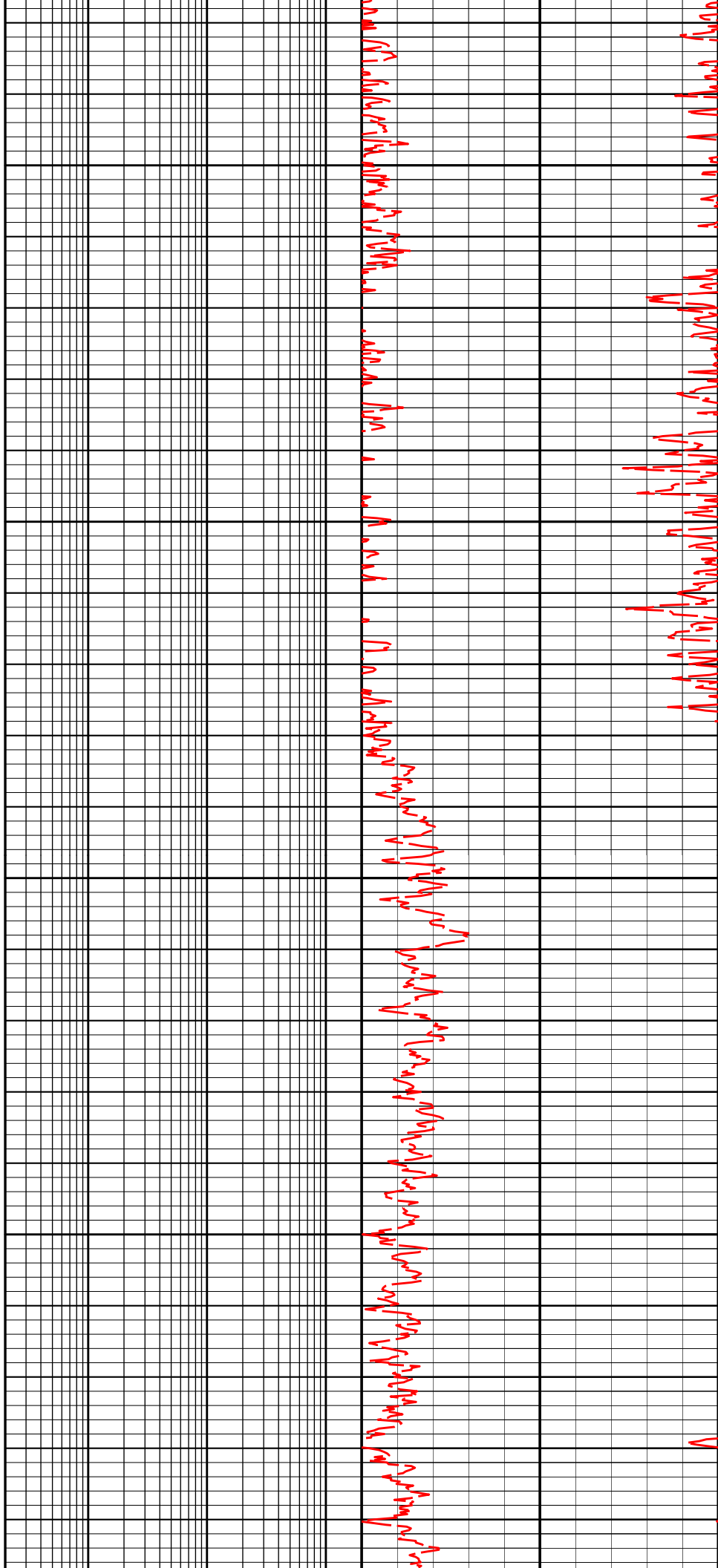


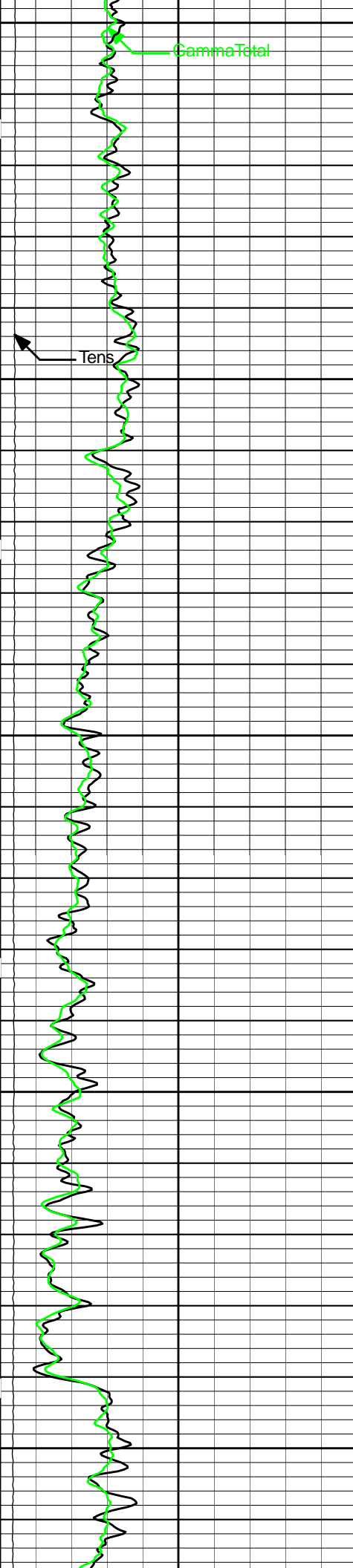
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1350

1400

1450





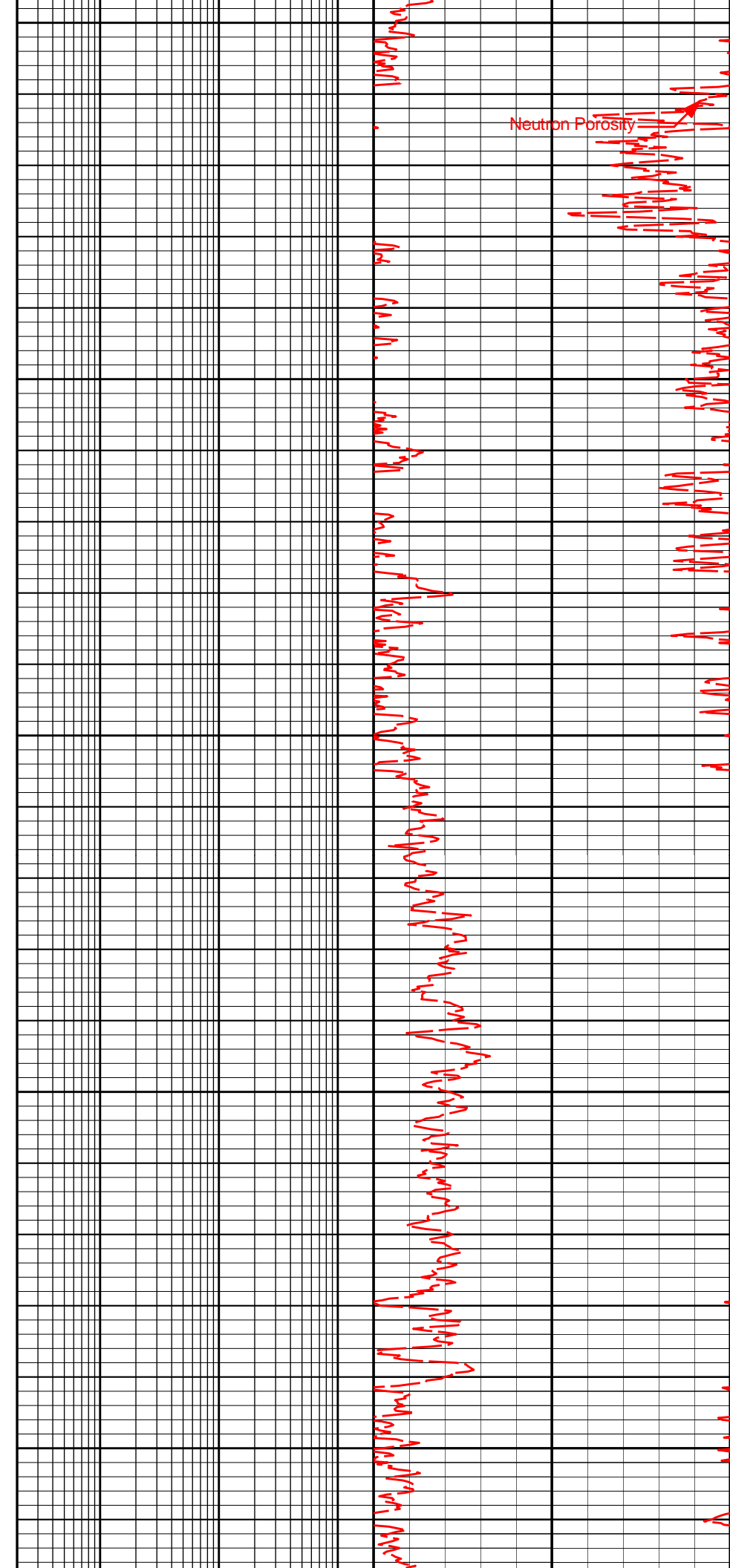
1500

1550

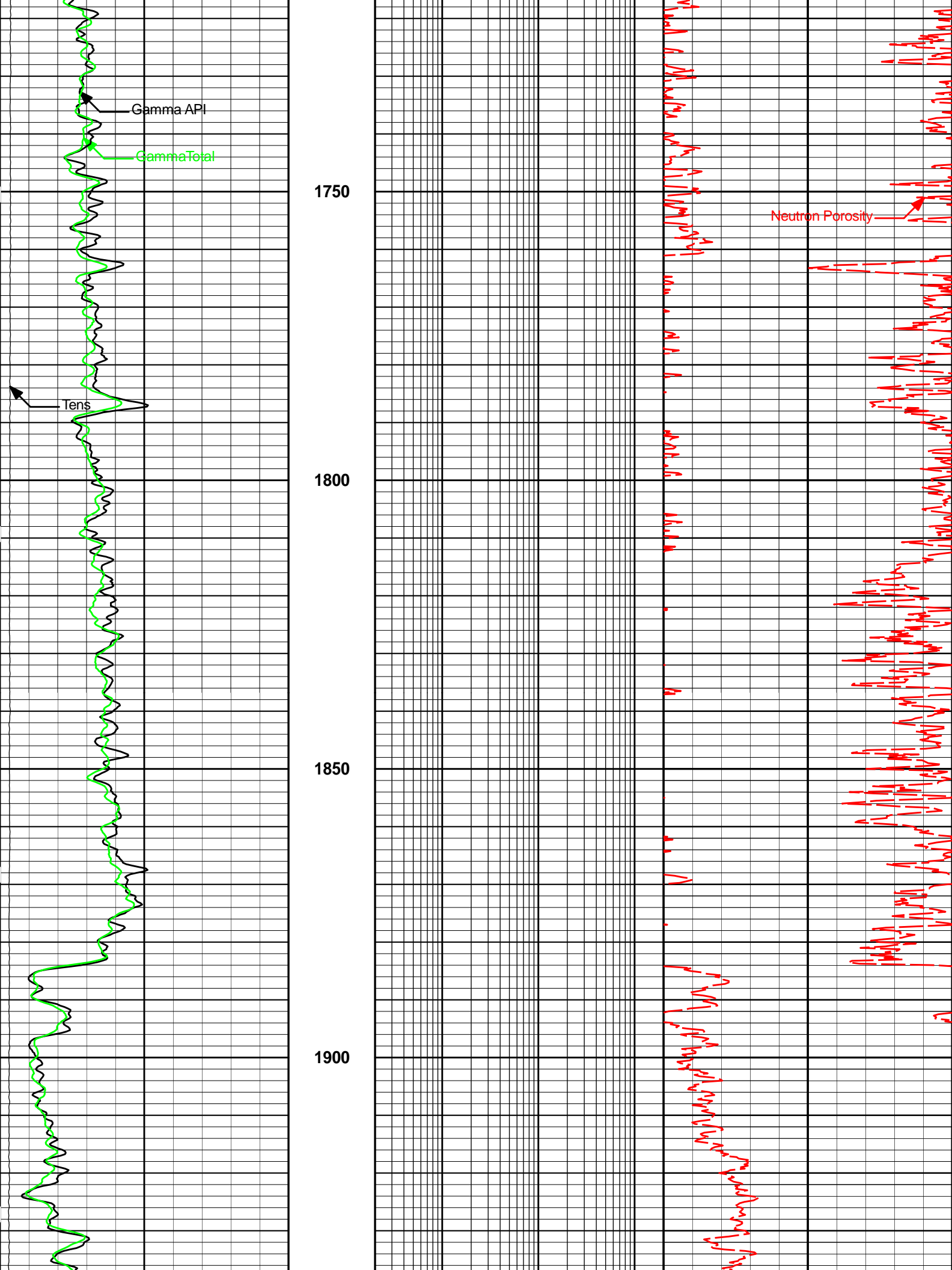
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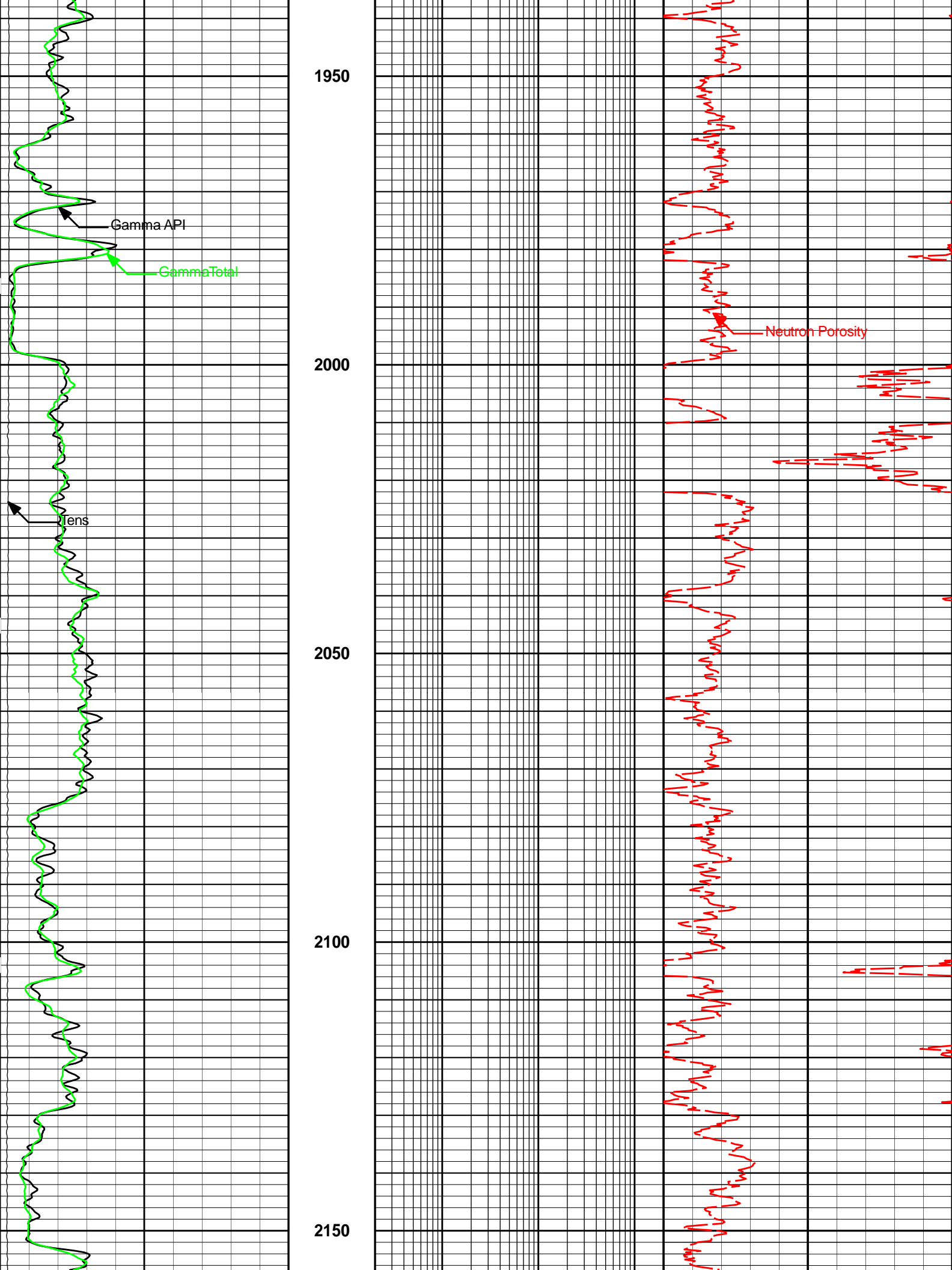
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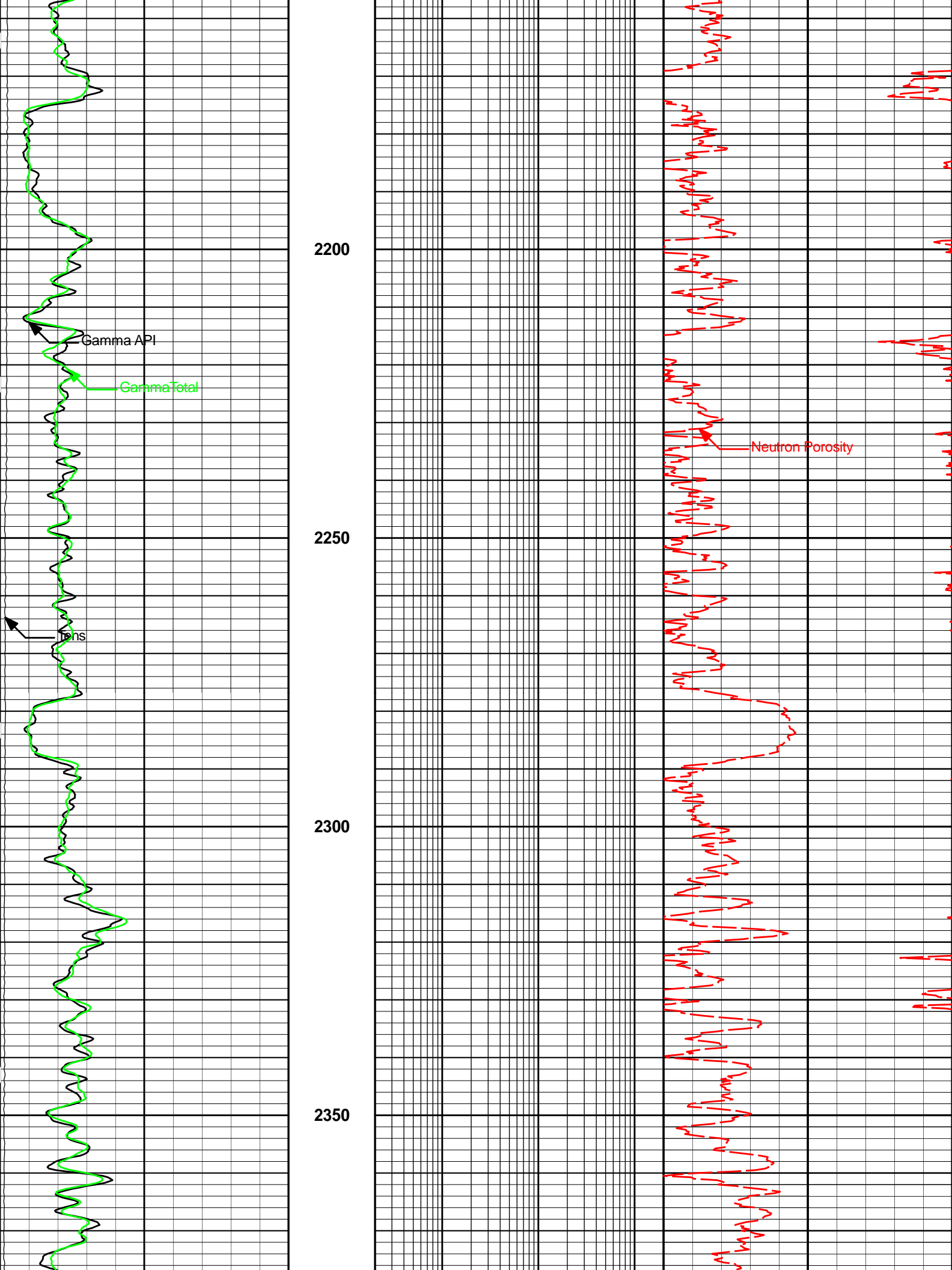
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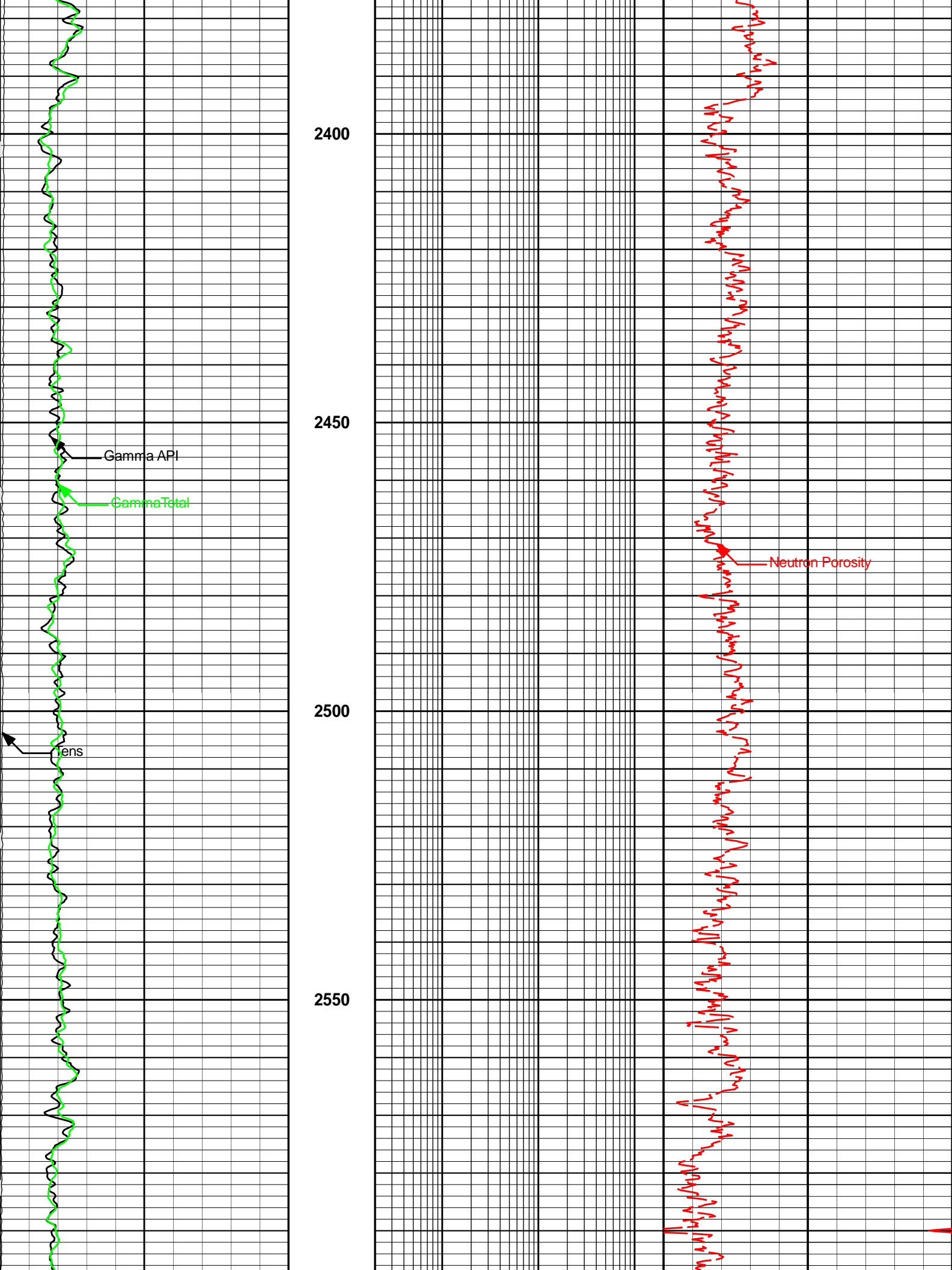


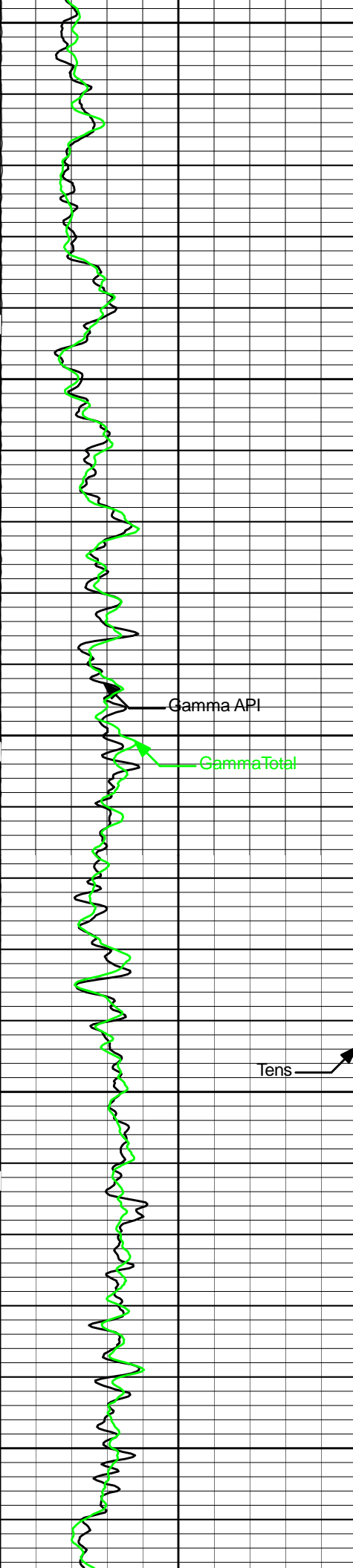
Neutron Porosity











2600

2650

2700

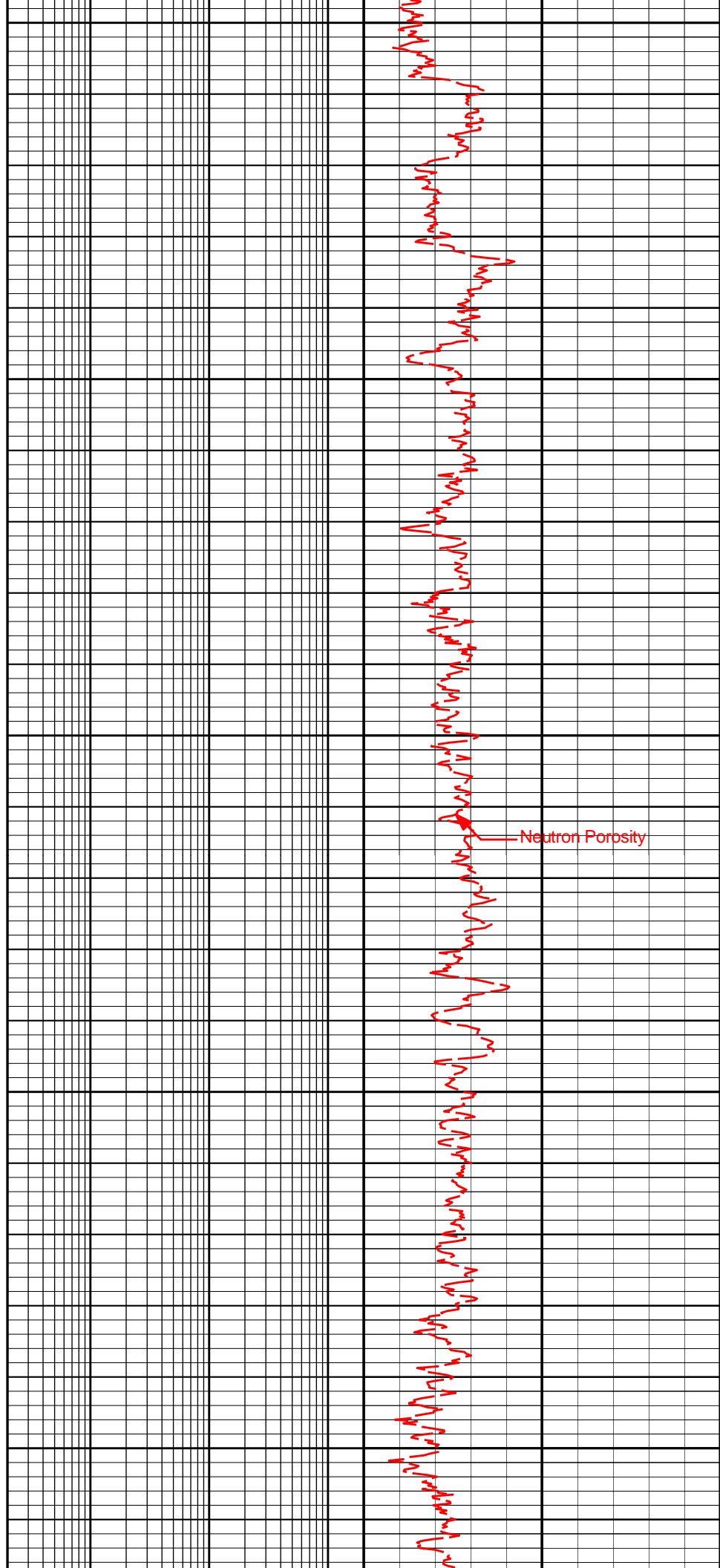
2750

2800

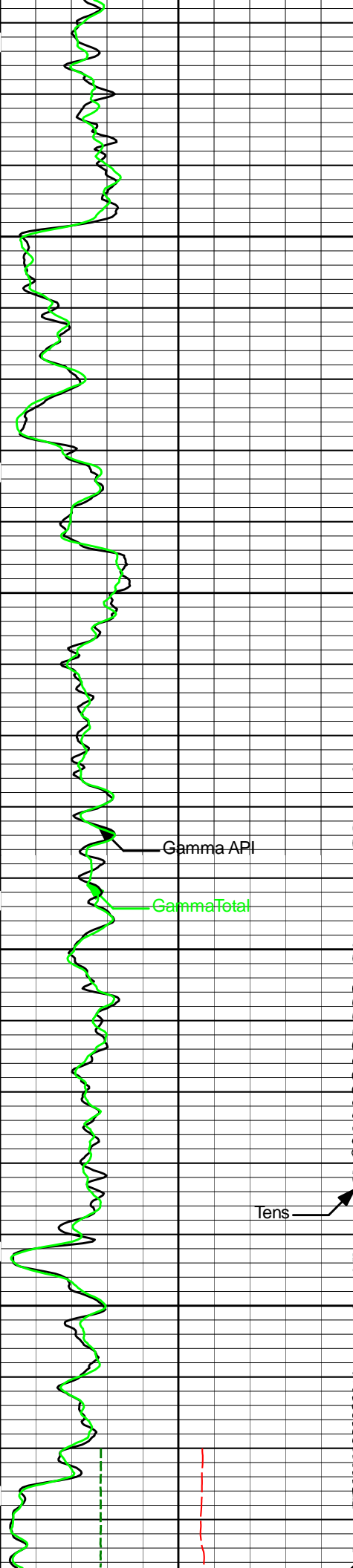
Gamma API

GammaTotal

Tens



Neutron Porosity



2850

2900

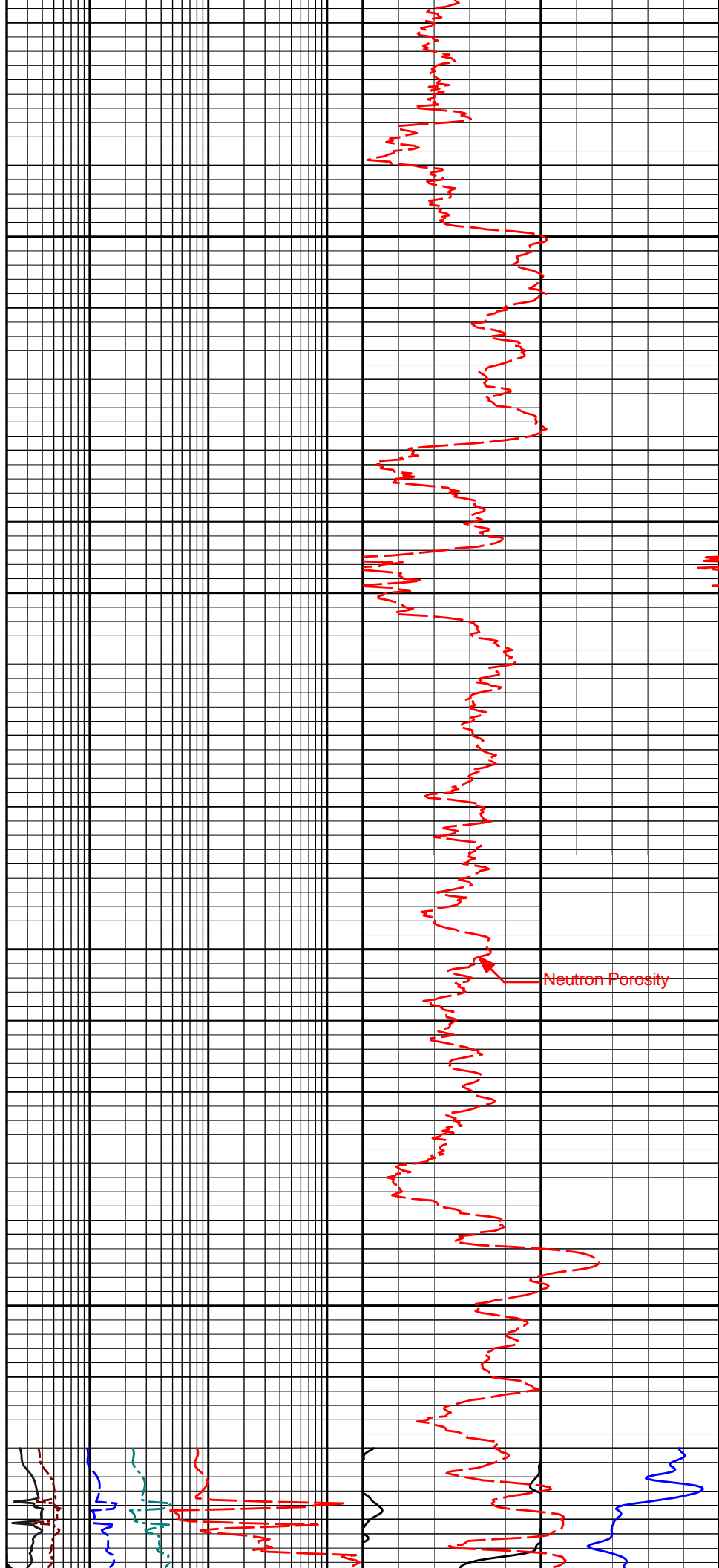
2950

3000

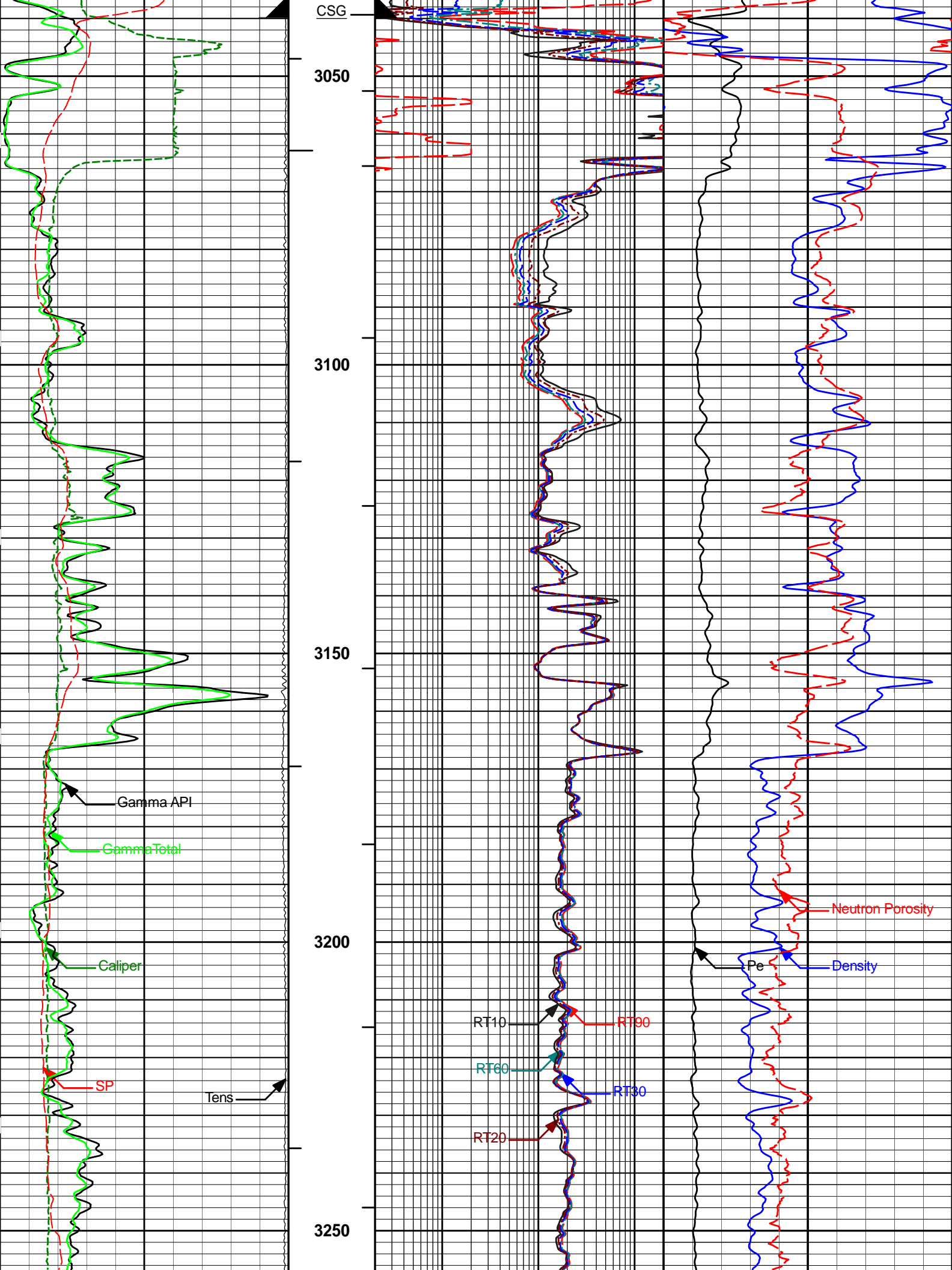
Gamma API

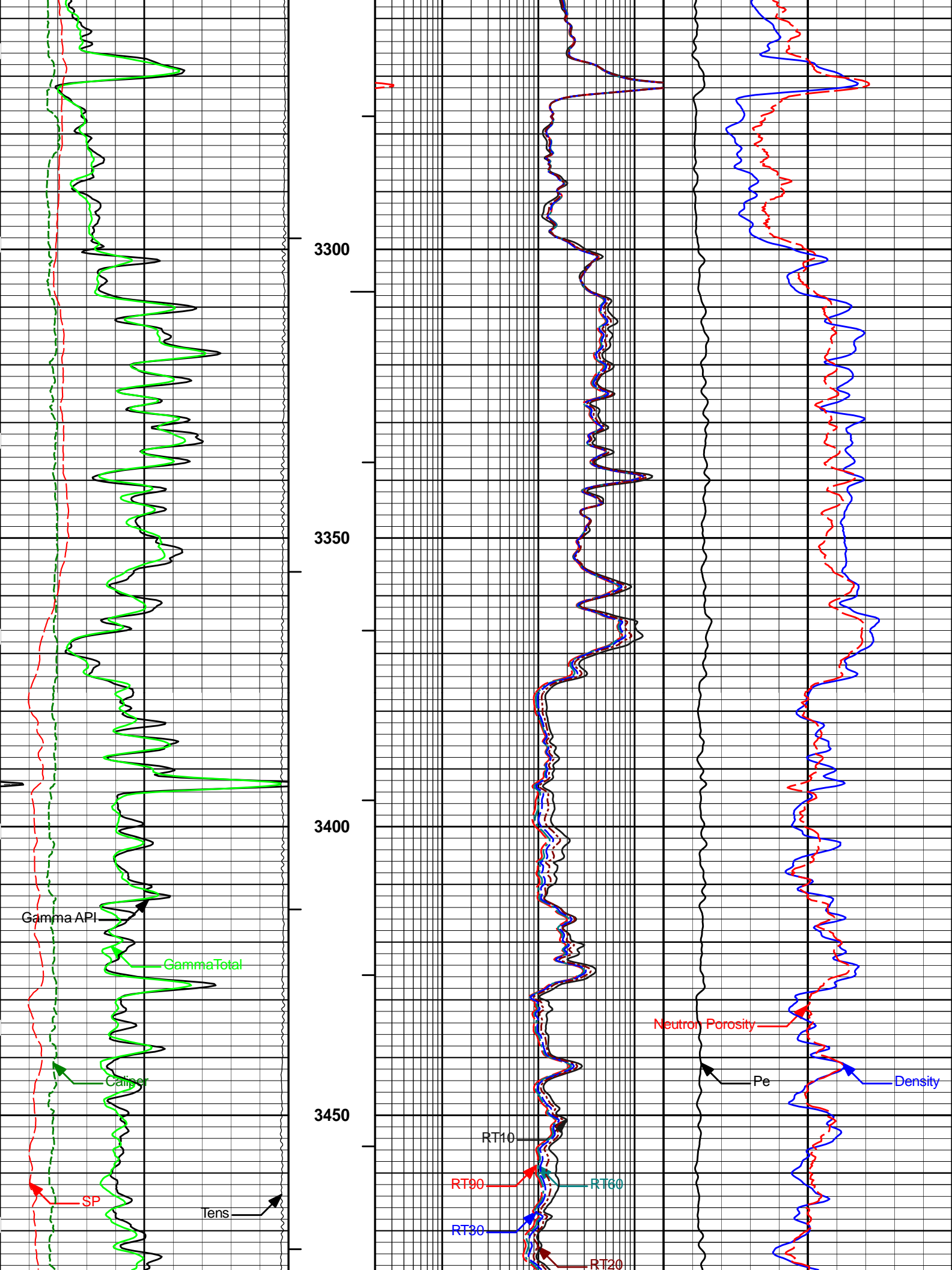
Gamma Total

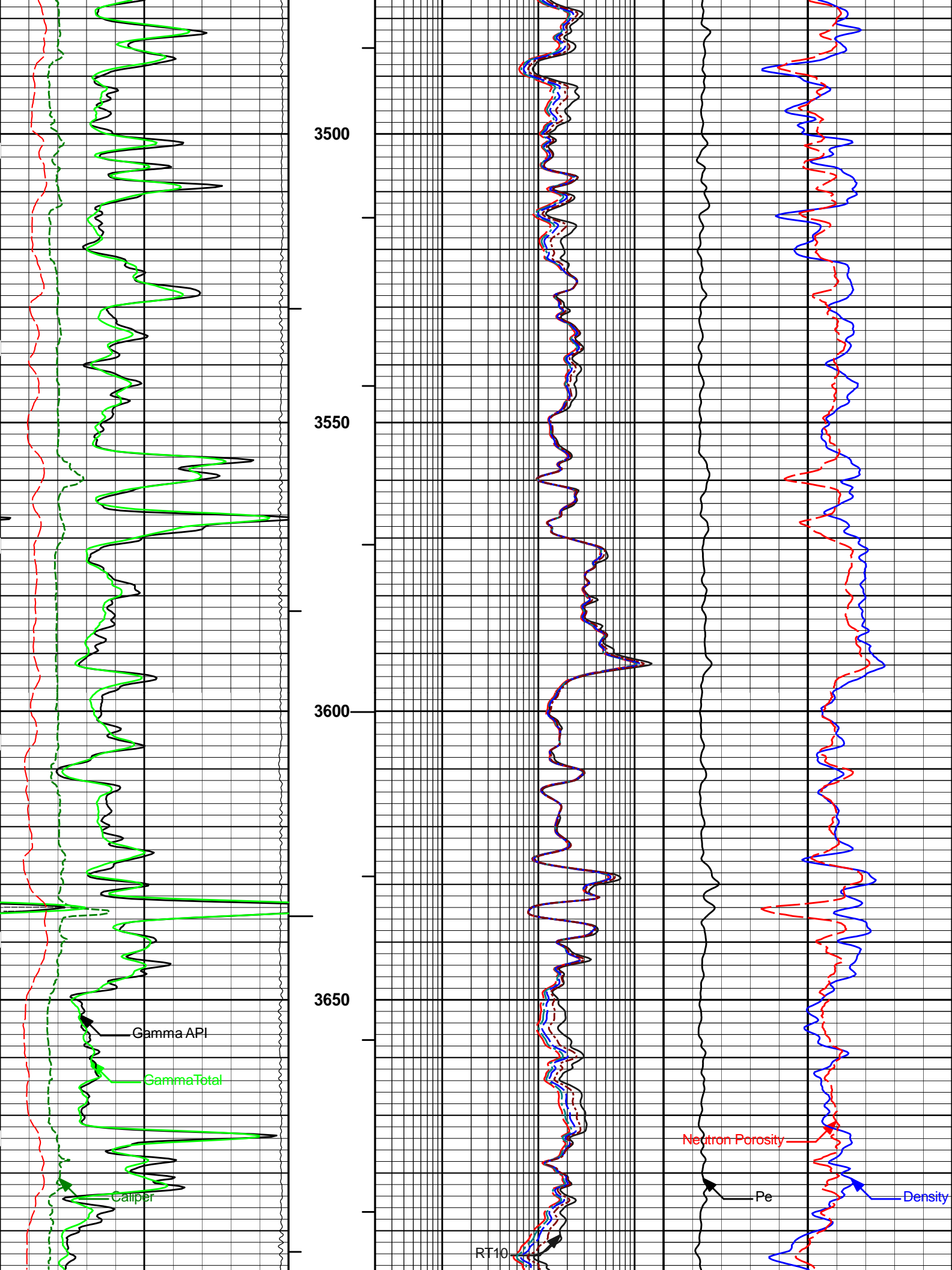
Tens

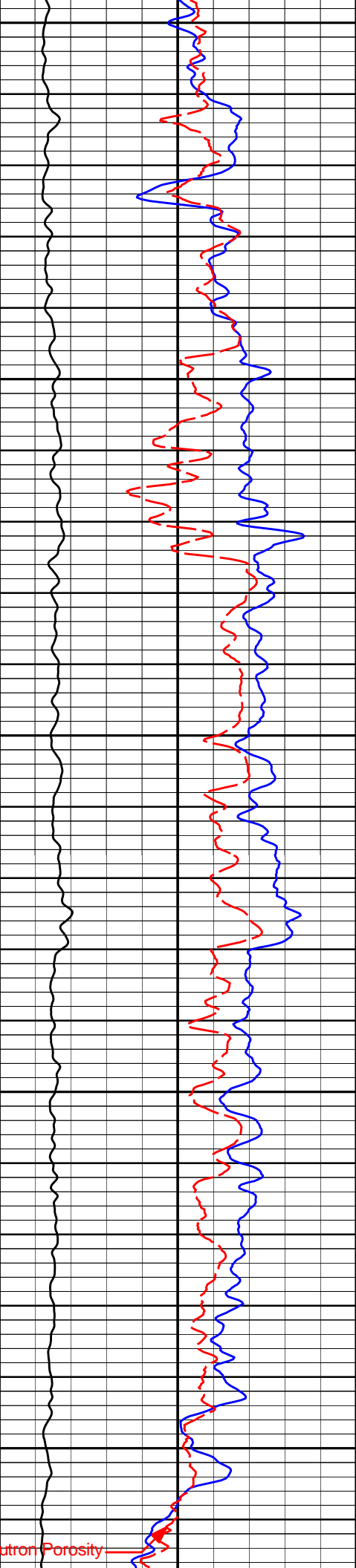
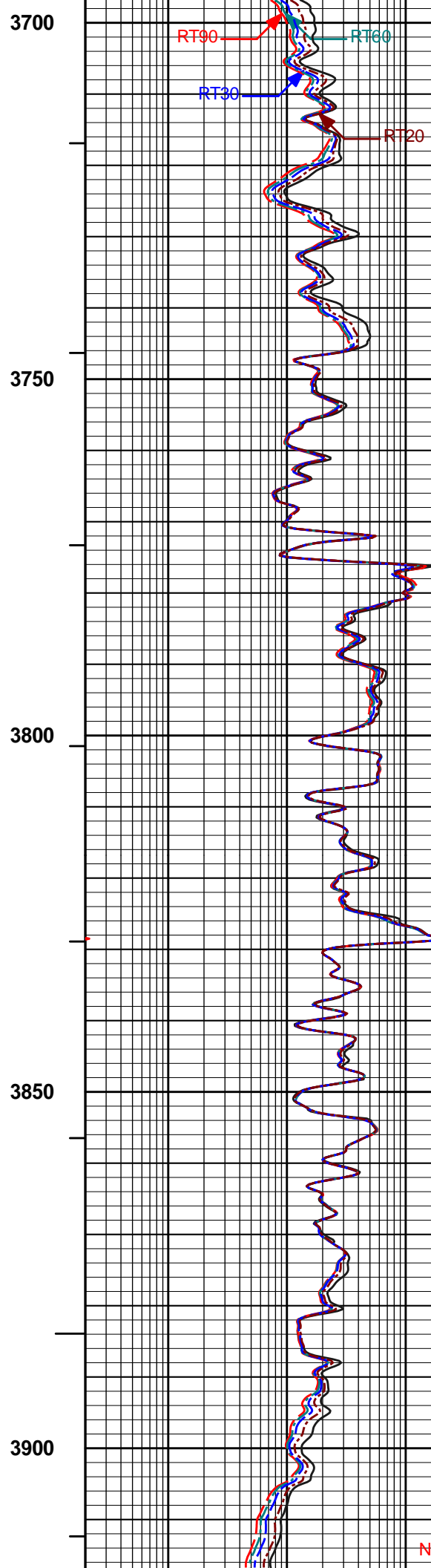
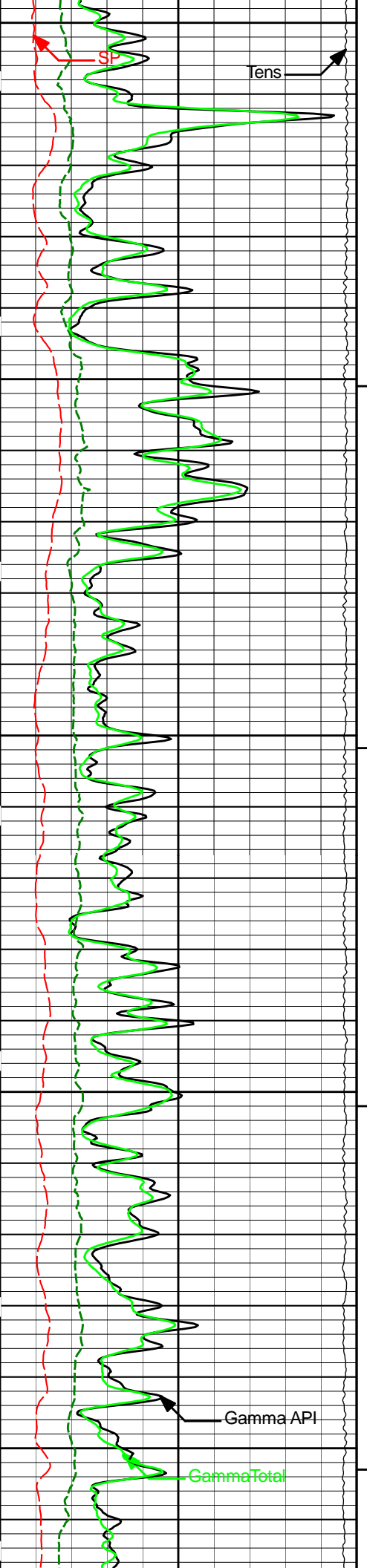


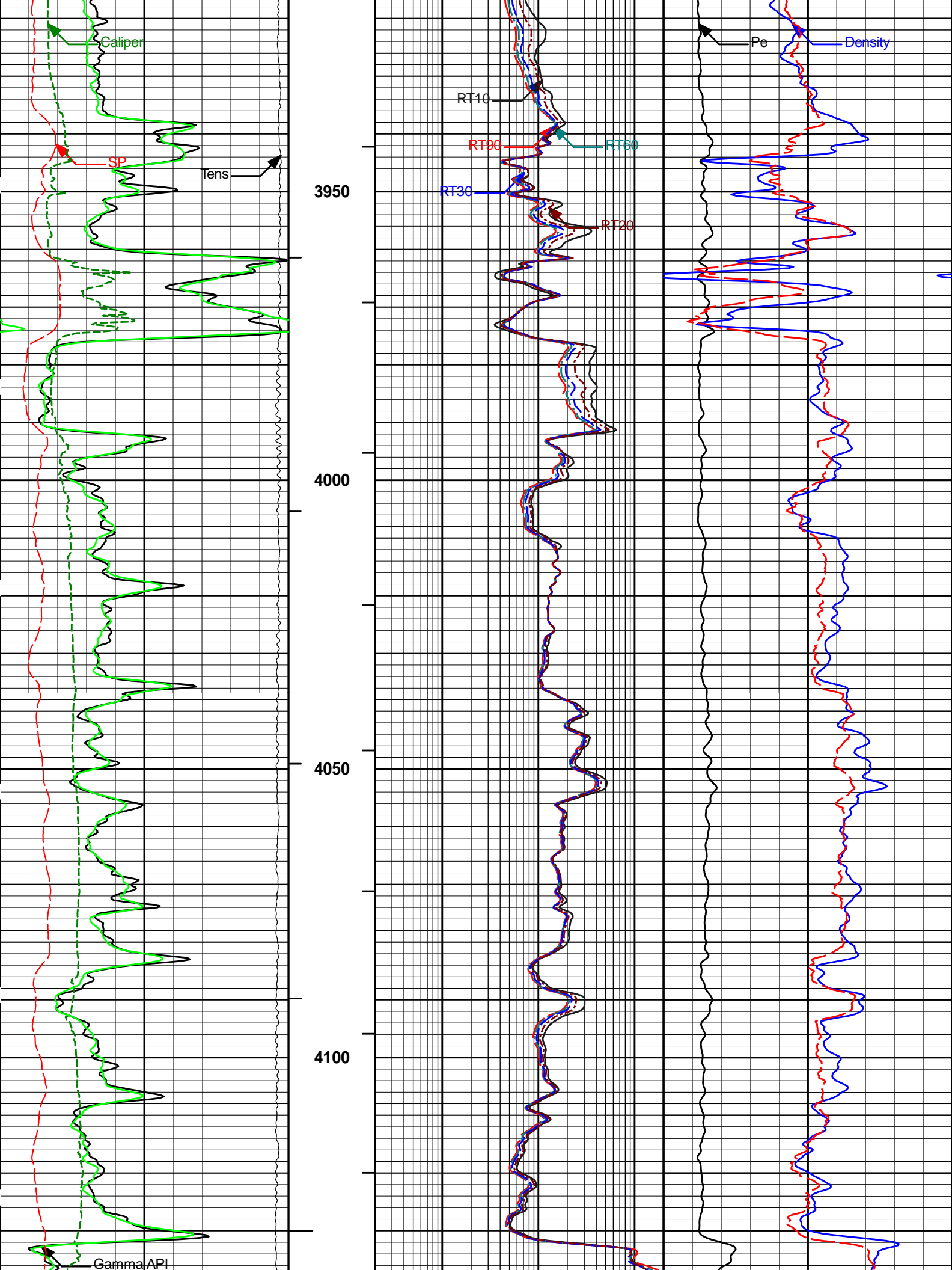
Neutron Porosity

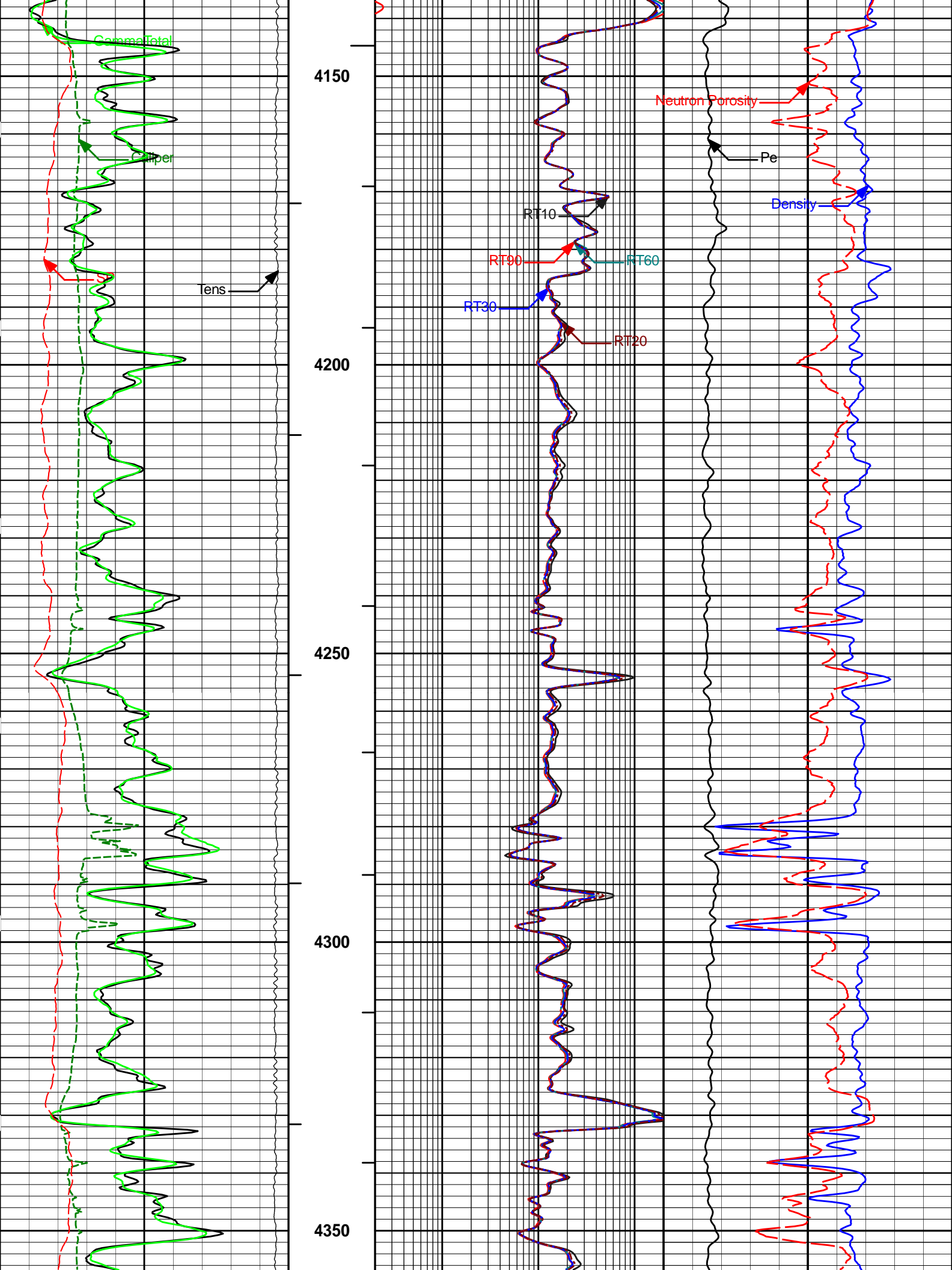


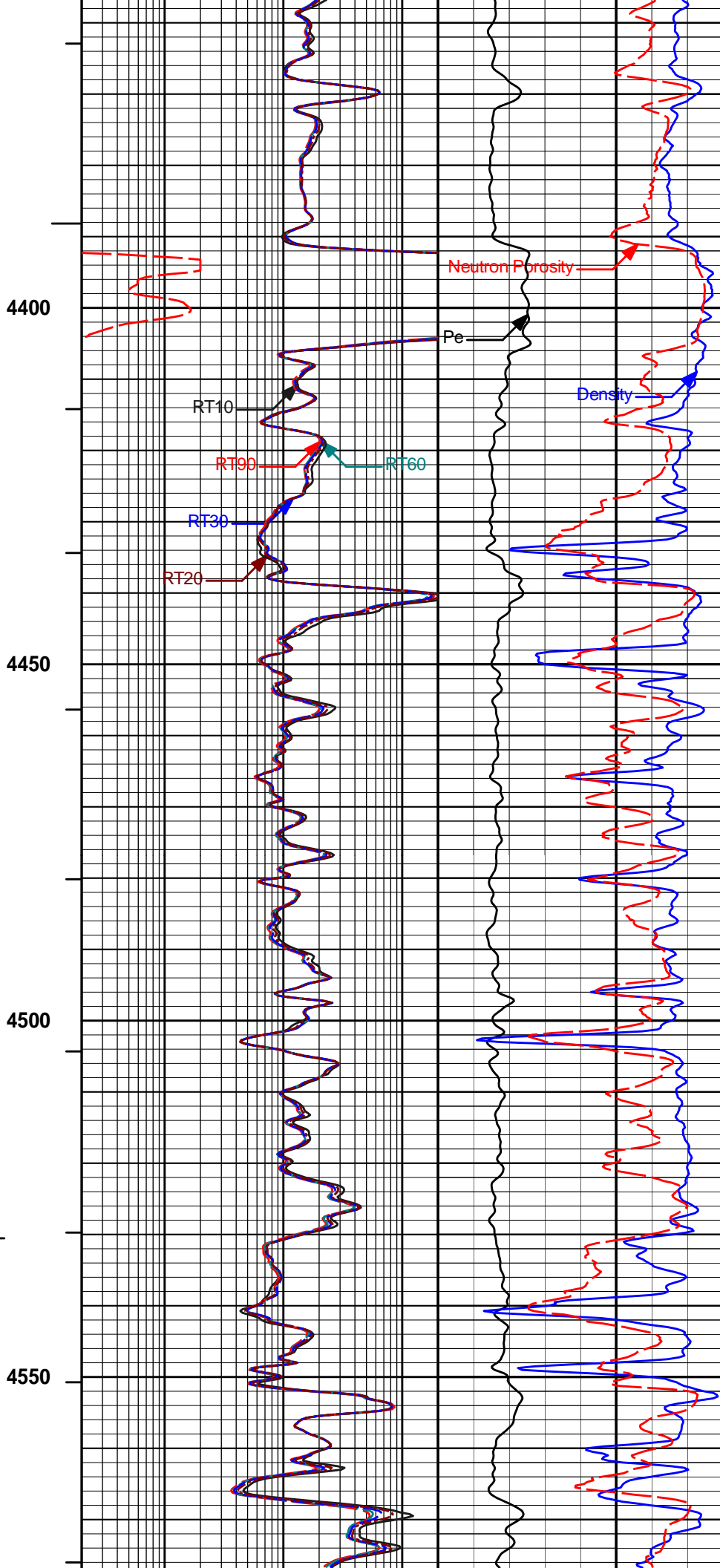
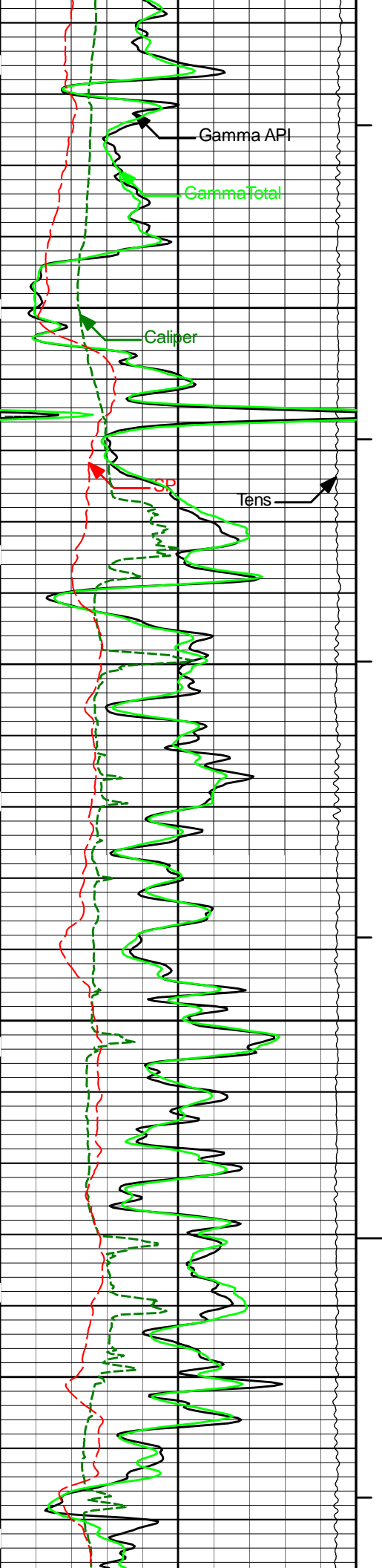


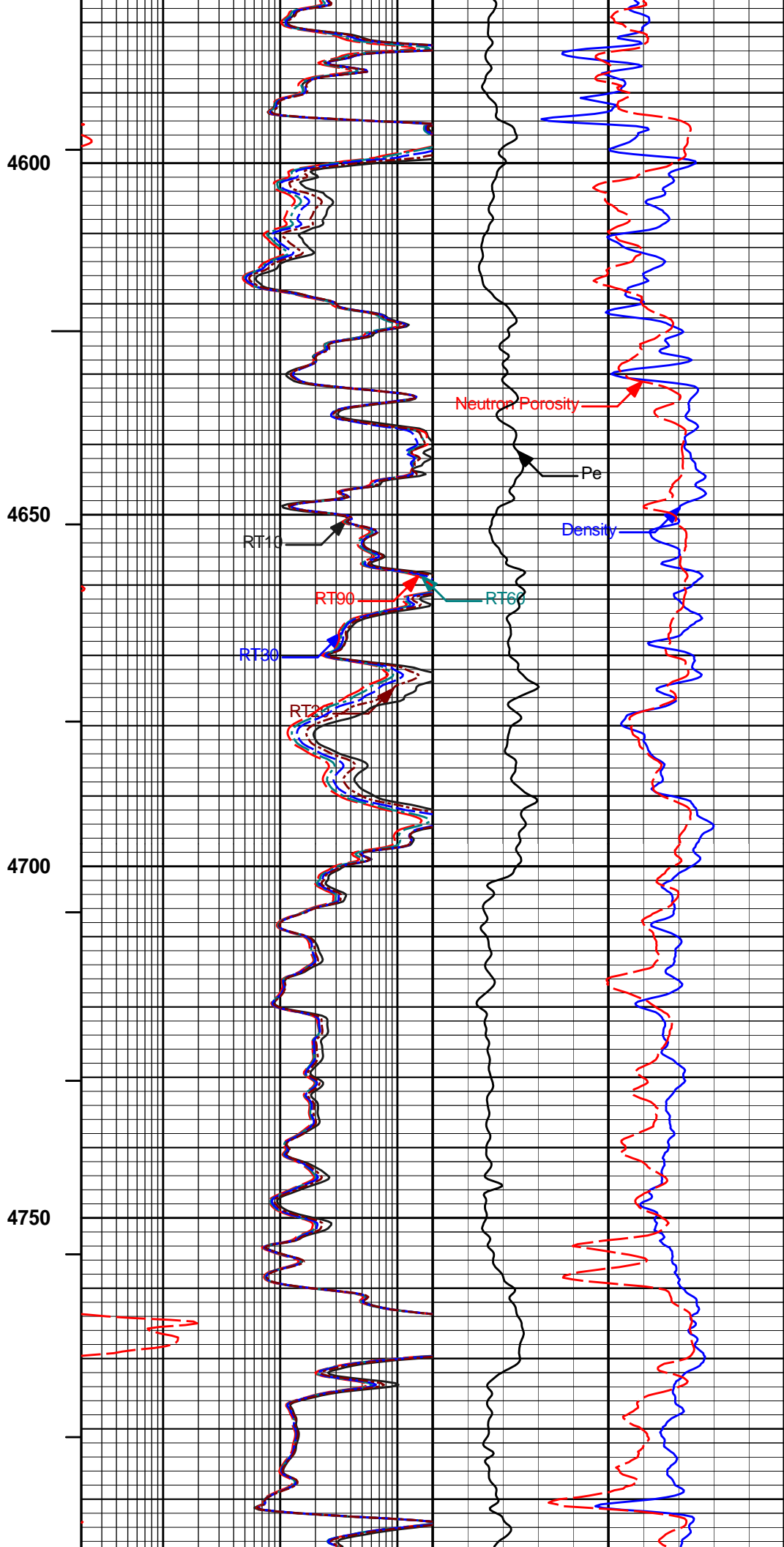
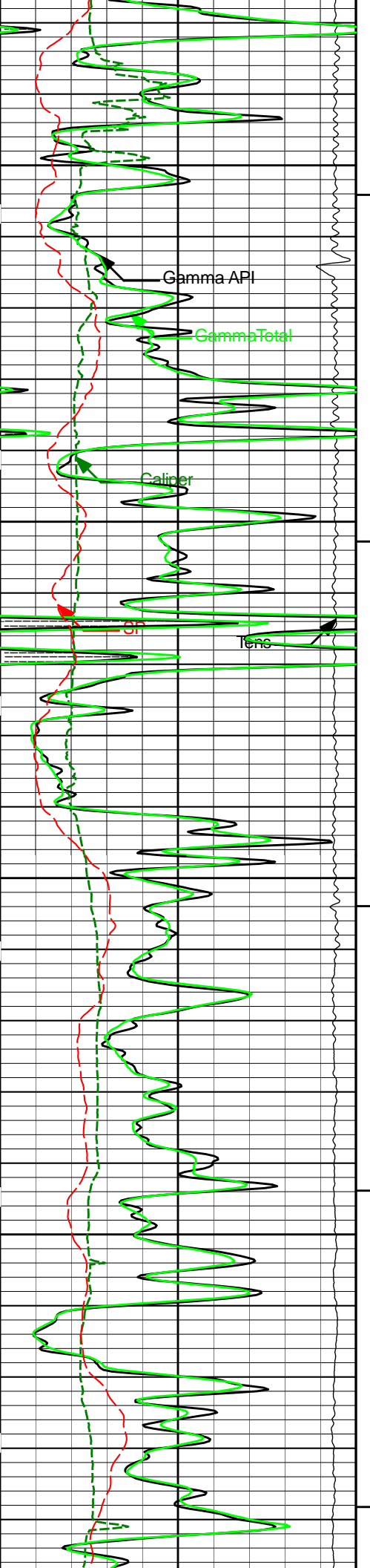


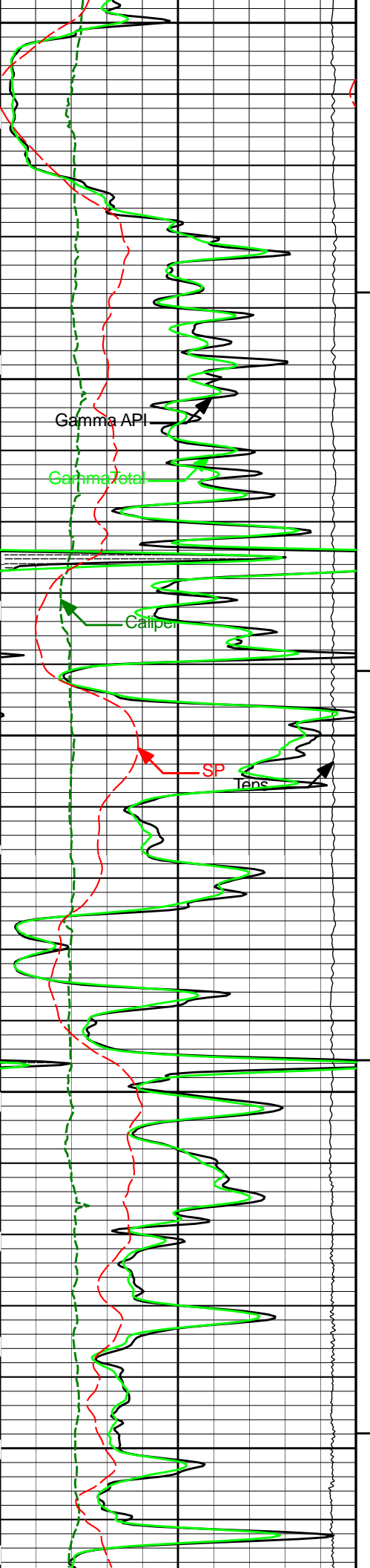












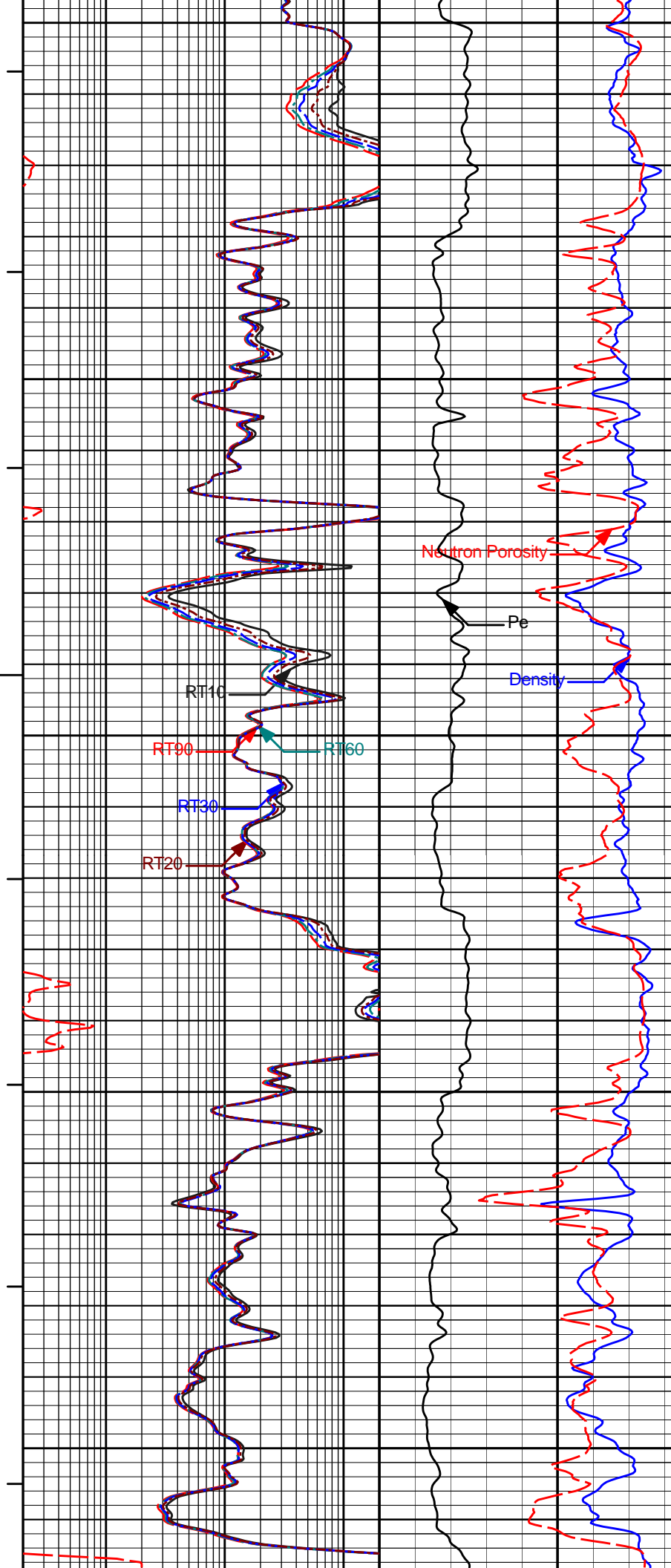
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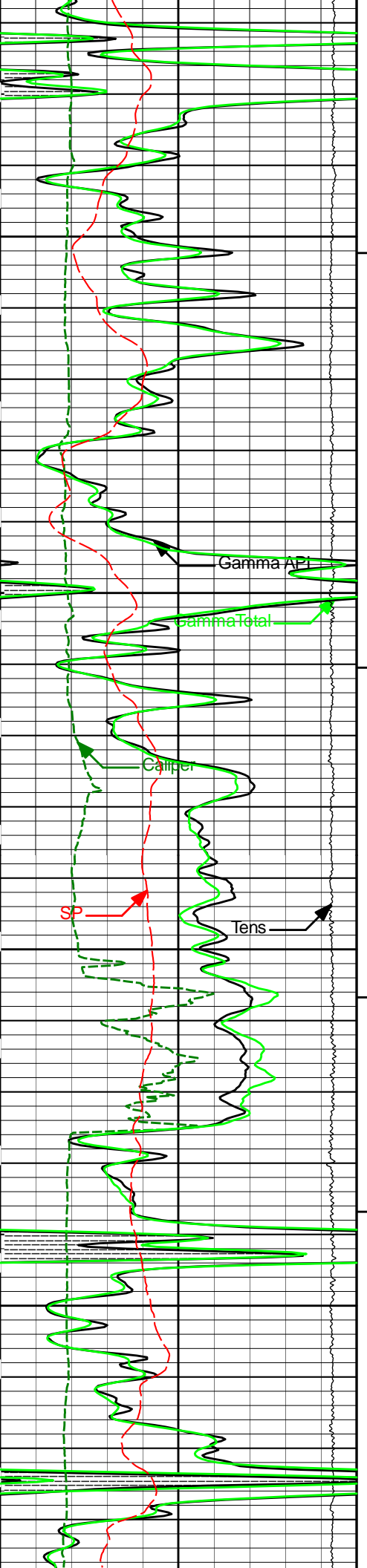
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4900

4950

5000



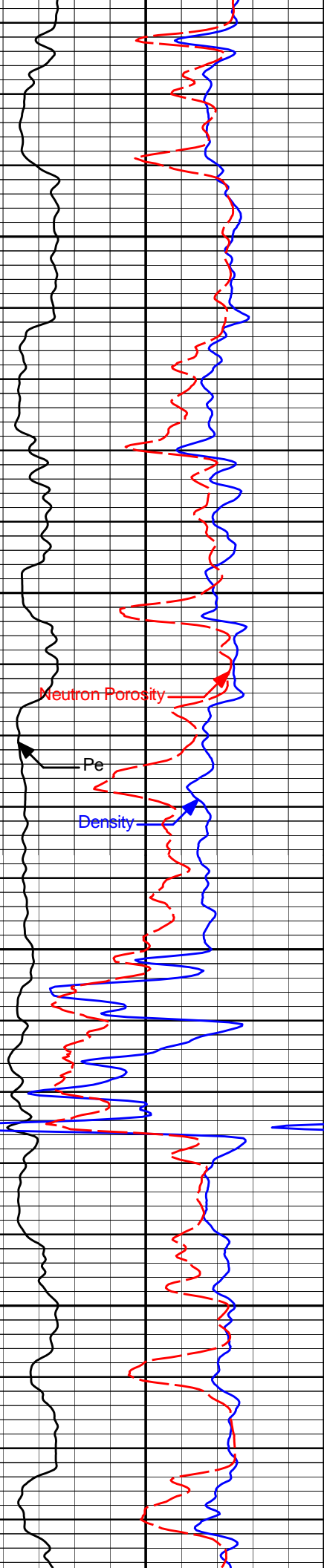
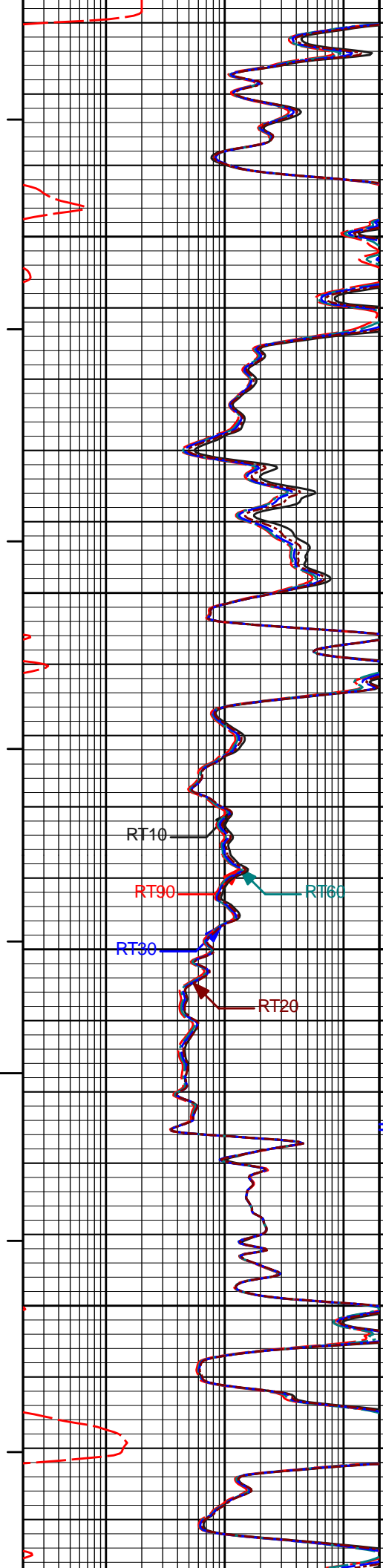


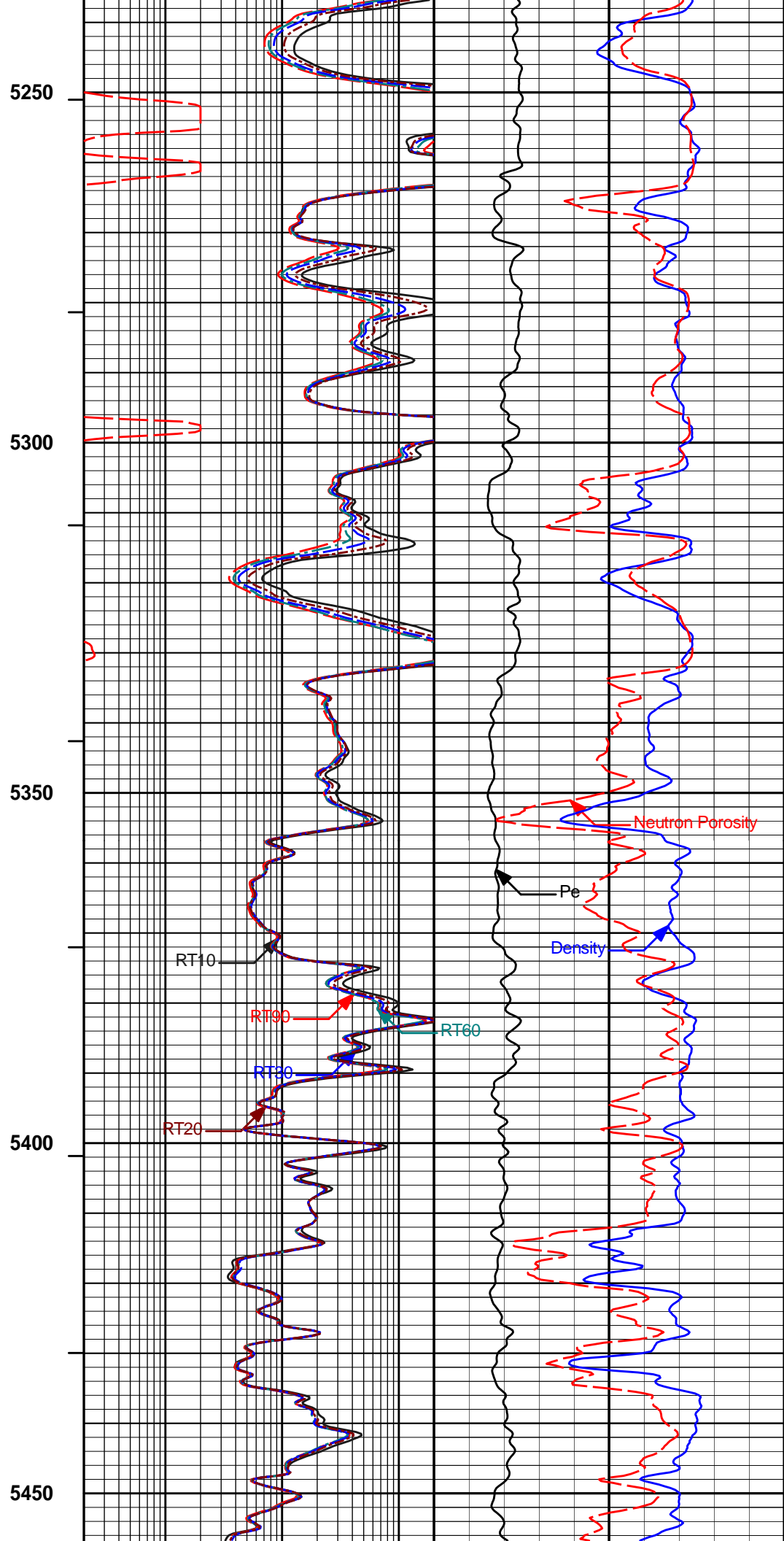
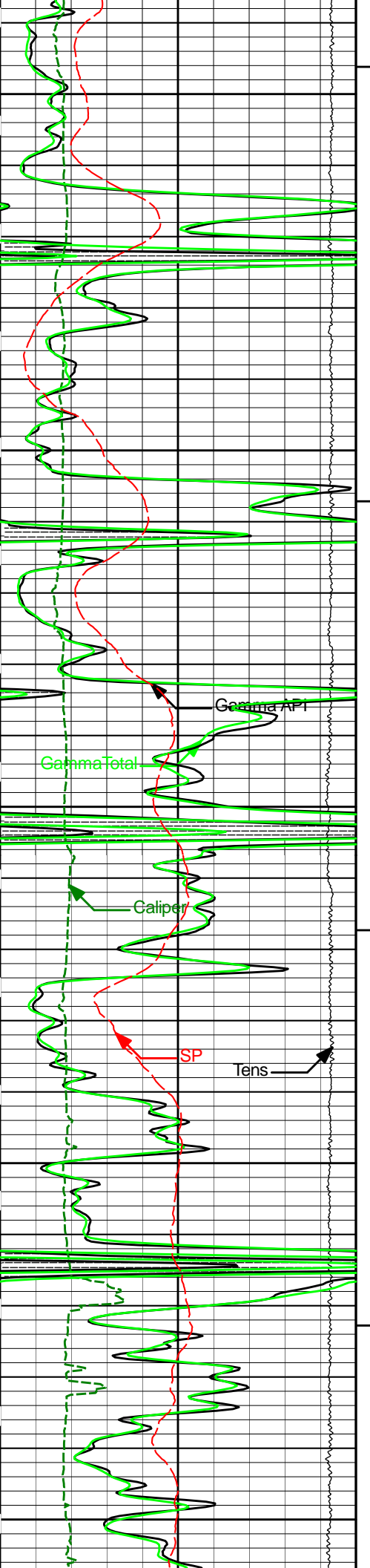
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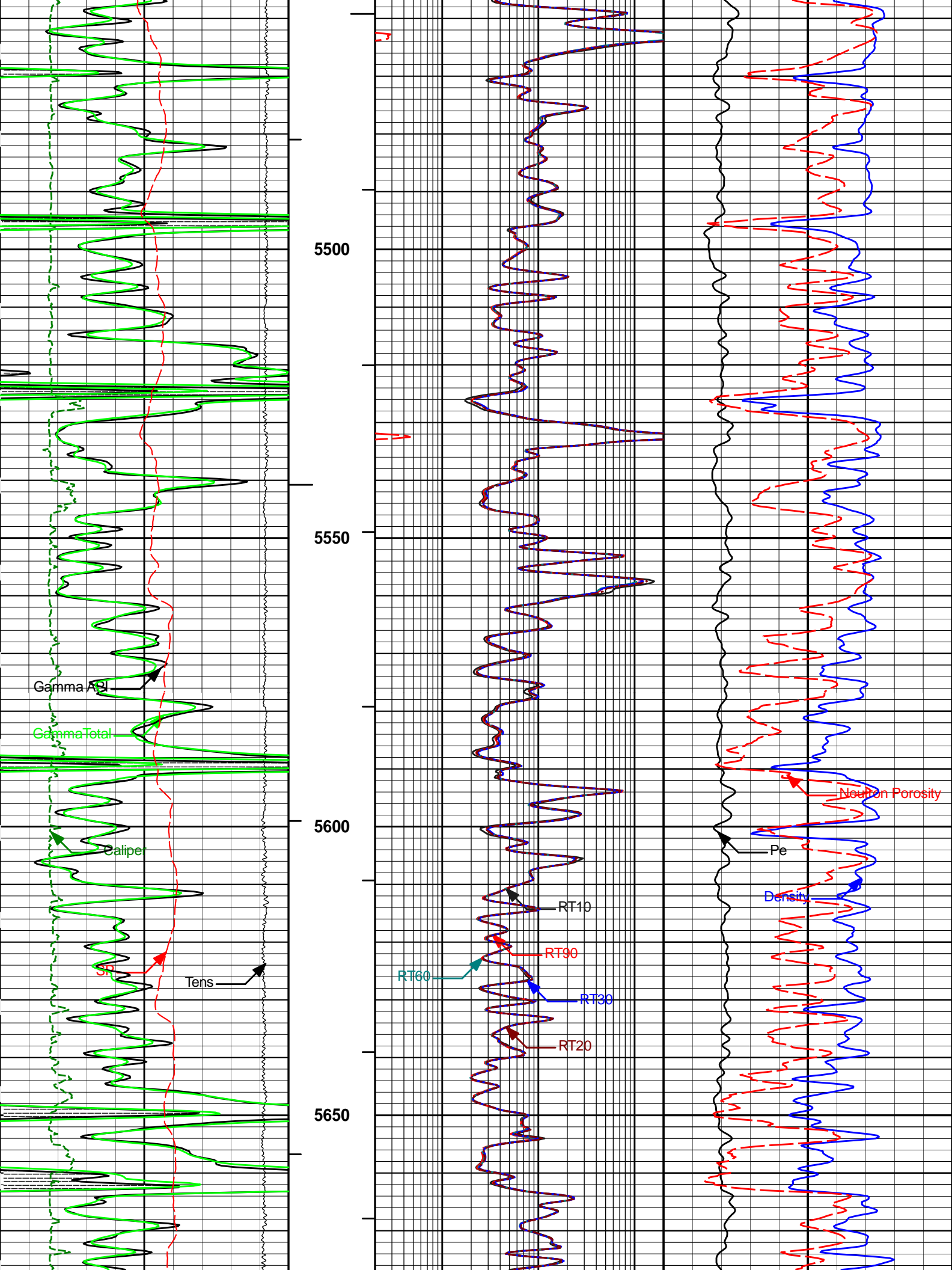
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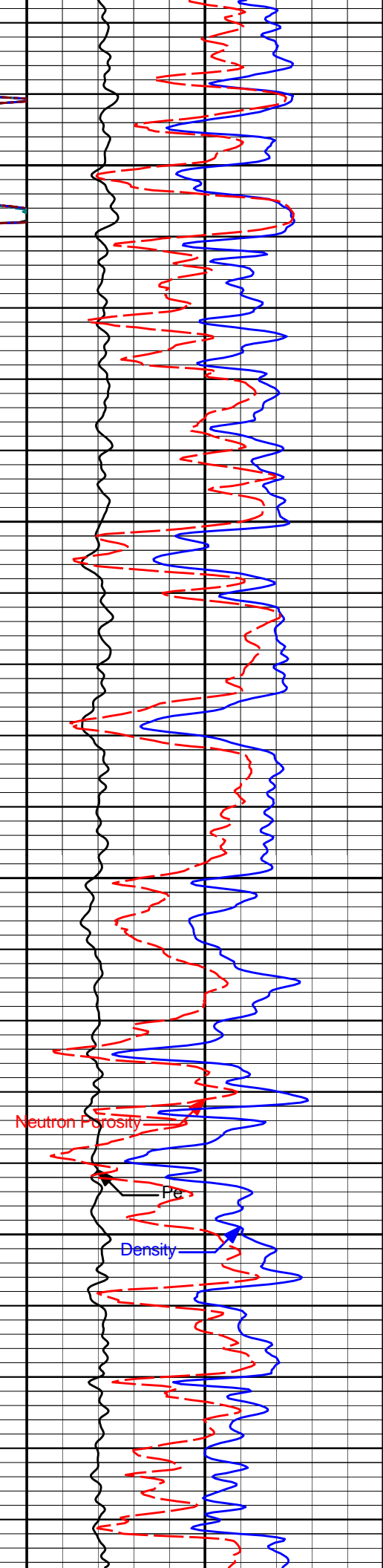
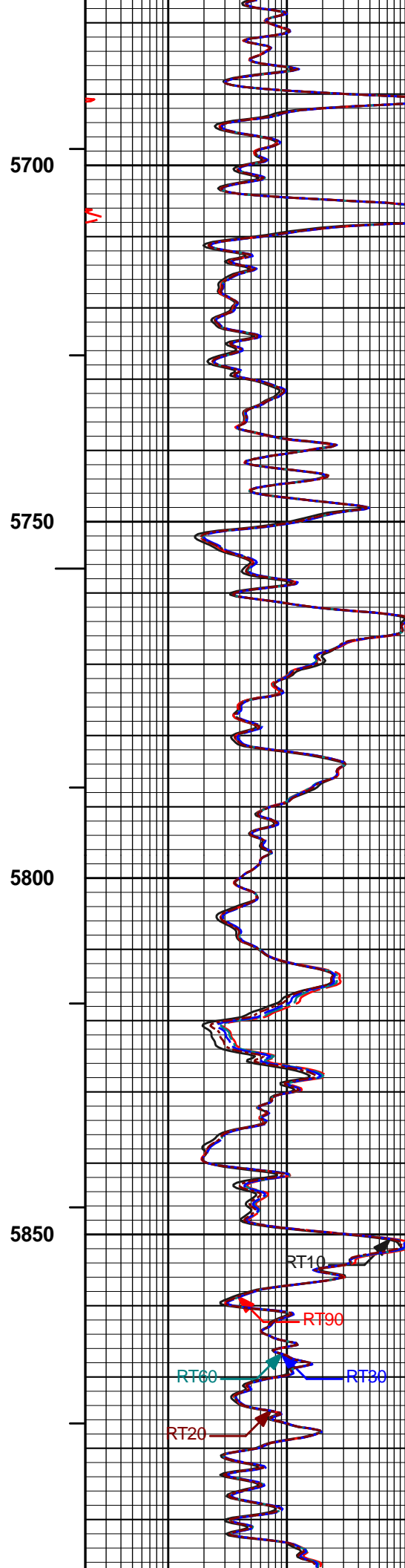
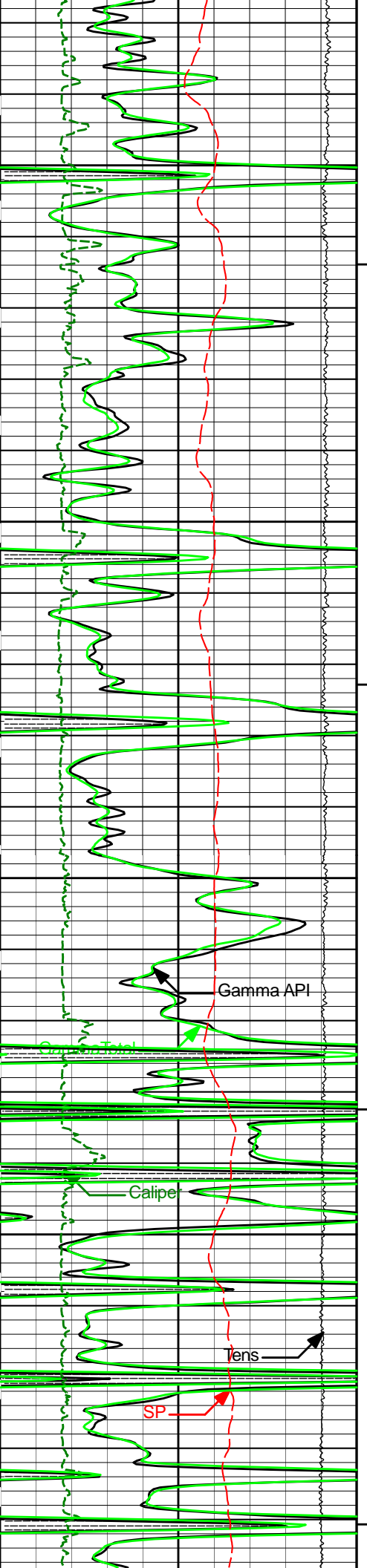
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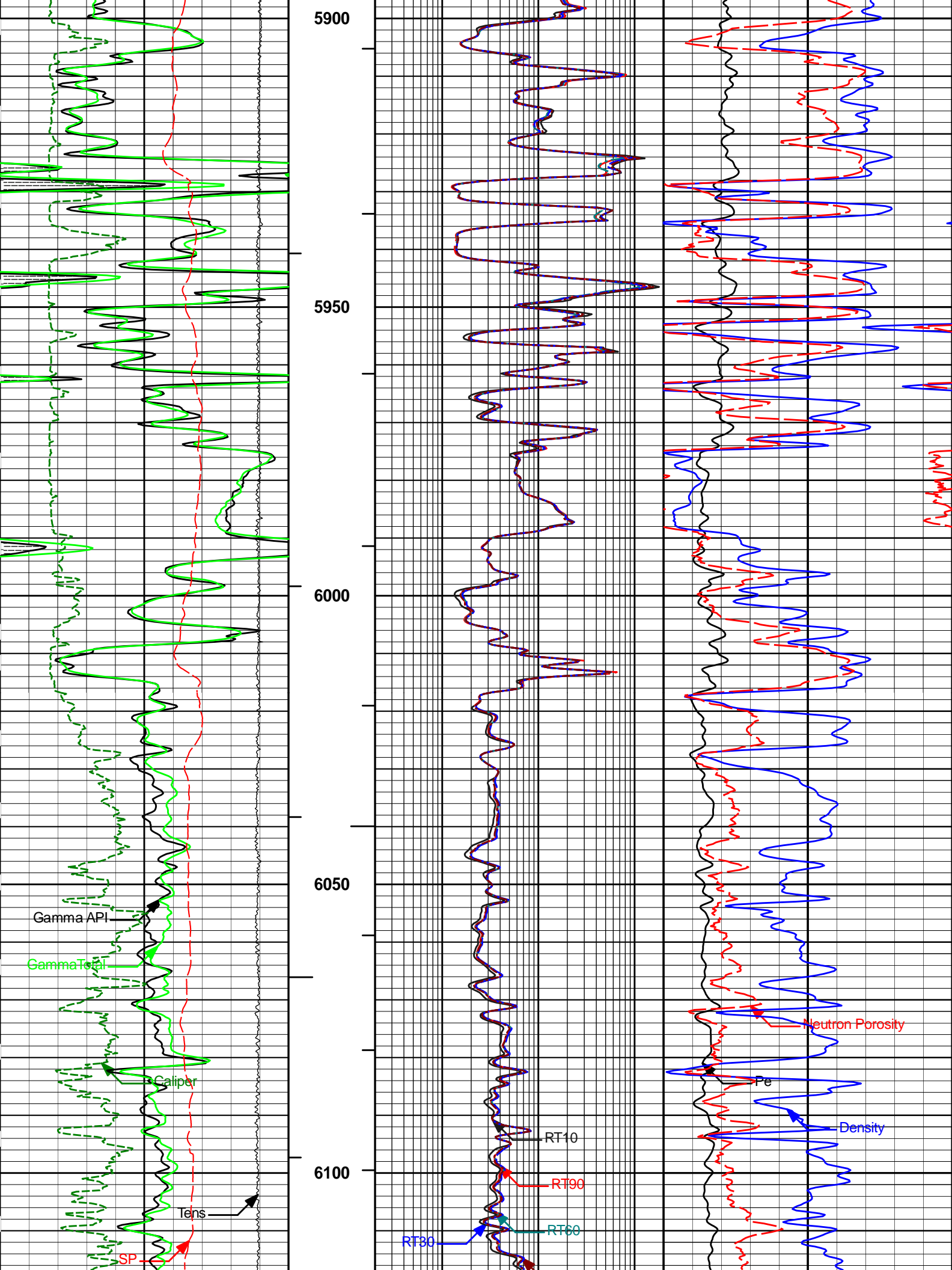
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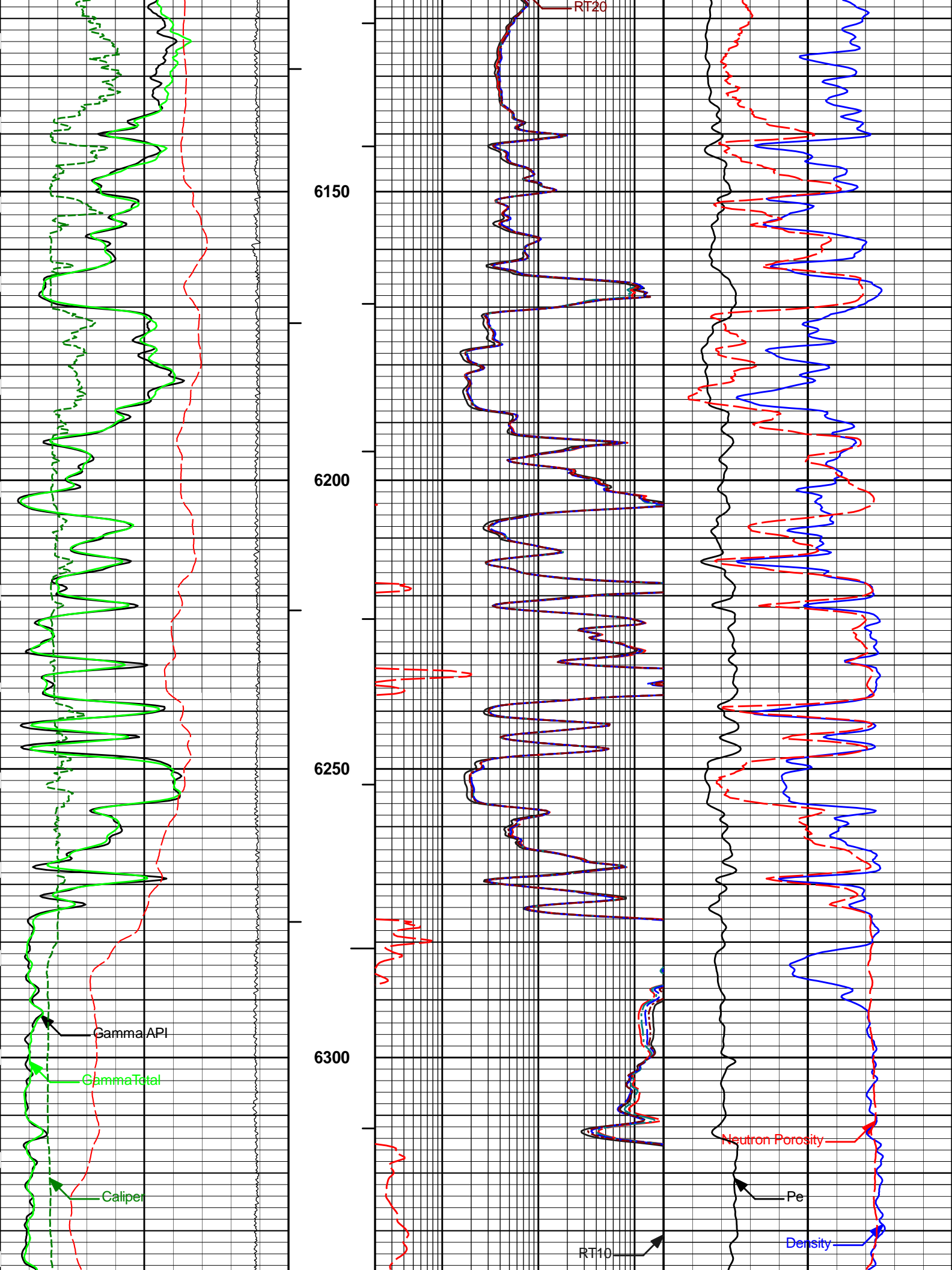


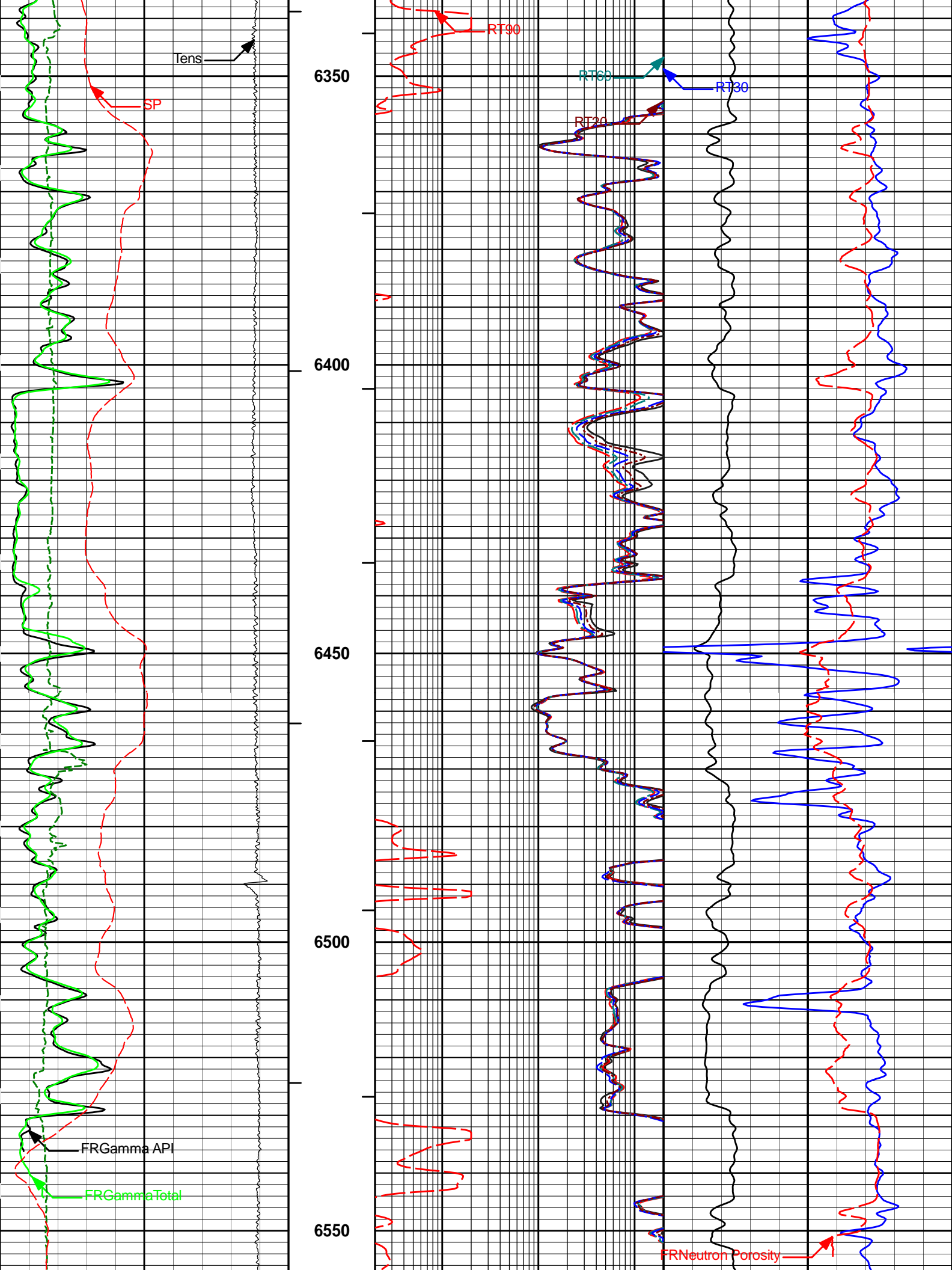


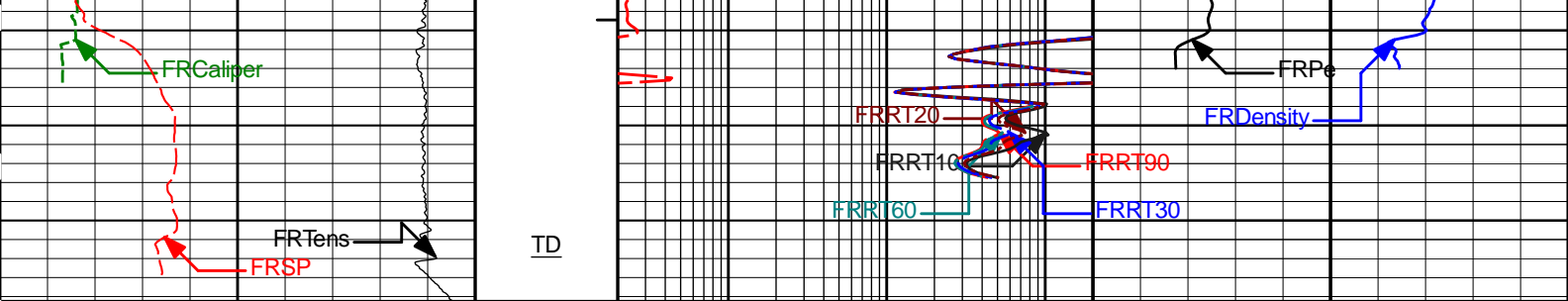












0	Gamma API	200	1 : 240	0.2	RT90	200	0	Pe	10
	gapi				ohmm			barns/electron	
0	GammaTotal	200	BHVT	0.2	RT60	200	1.95	Density	2.95
	gapi				ohmm			gram per cc	
6	Caliper	16	AHVT	0.2	RT30	200	0.45	Neutron Porosity	-0.15
	inches				ohmm			dec	
12K	Tens	2K		0.2	RT20	200			
	pounds				ohmm				
-200	SP	100		0.2	RT10	200			
	millivolts				ohmm				

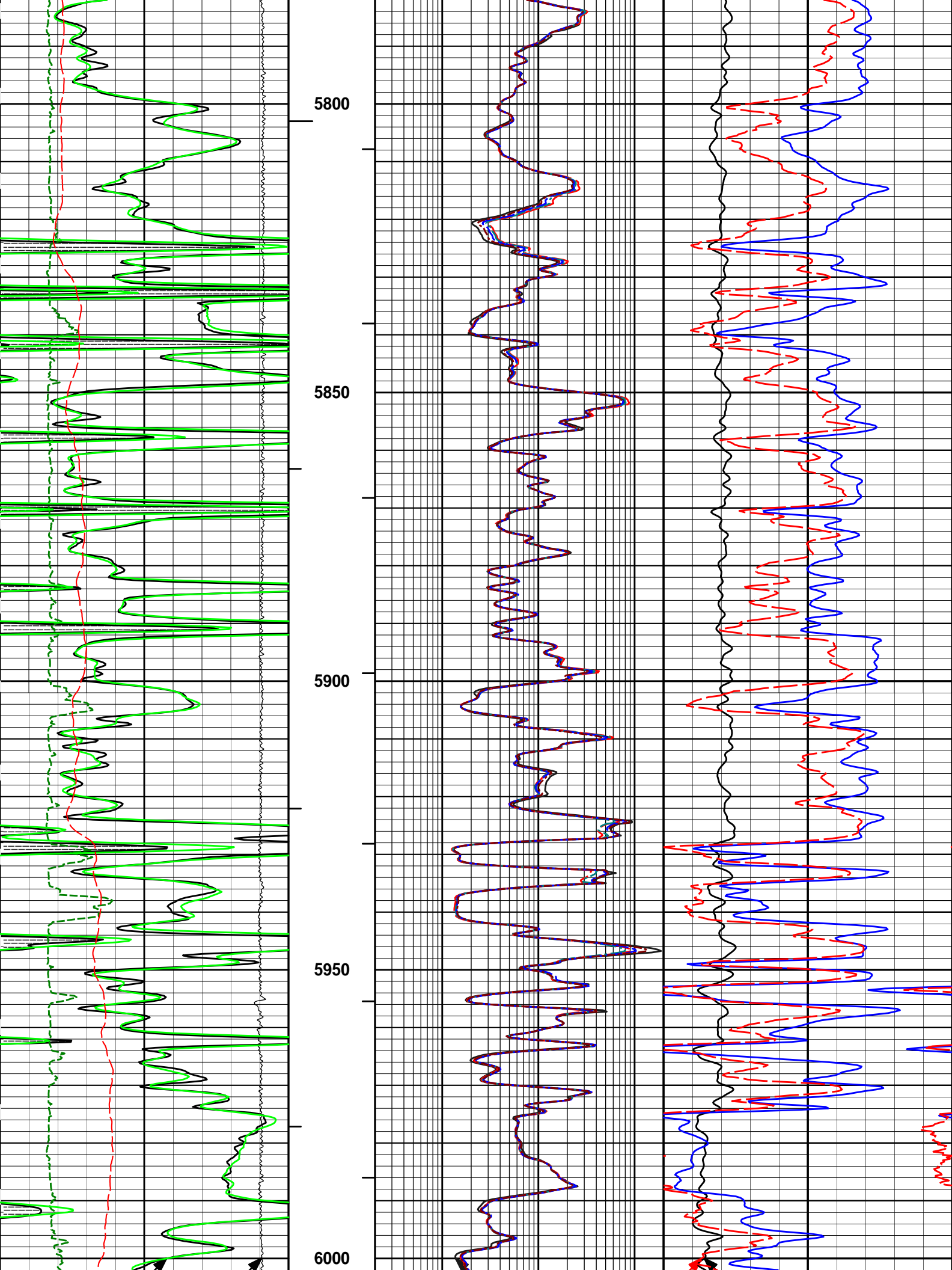
HALLIBURTON Plot Time: 01-Aug-14 10:34:31
 Plot Range: 54.33 ft to 6588.5 ft
 Data: HARMON_42-6-17\Well Based\MAIN
 Plot File: \COMP\MAIN

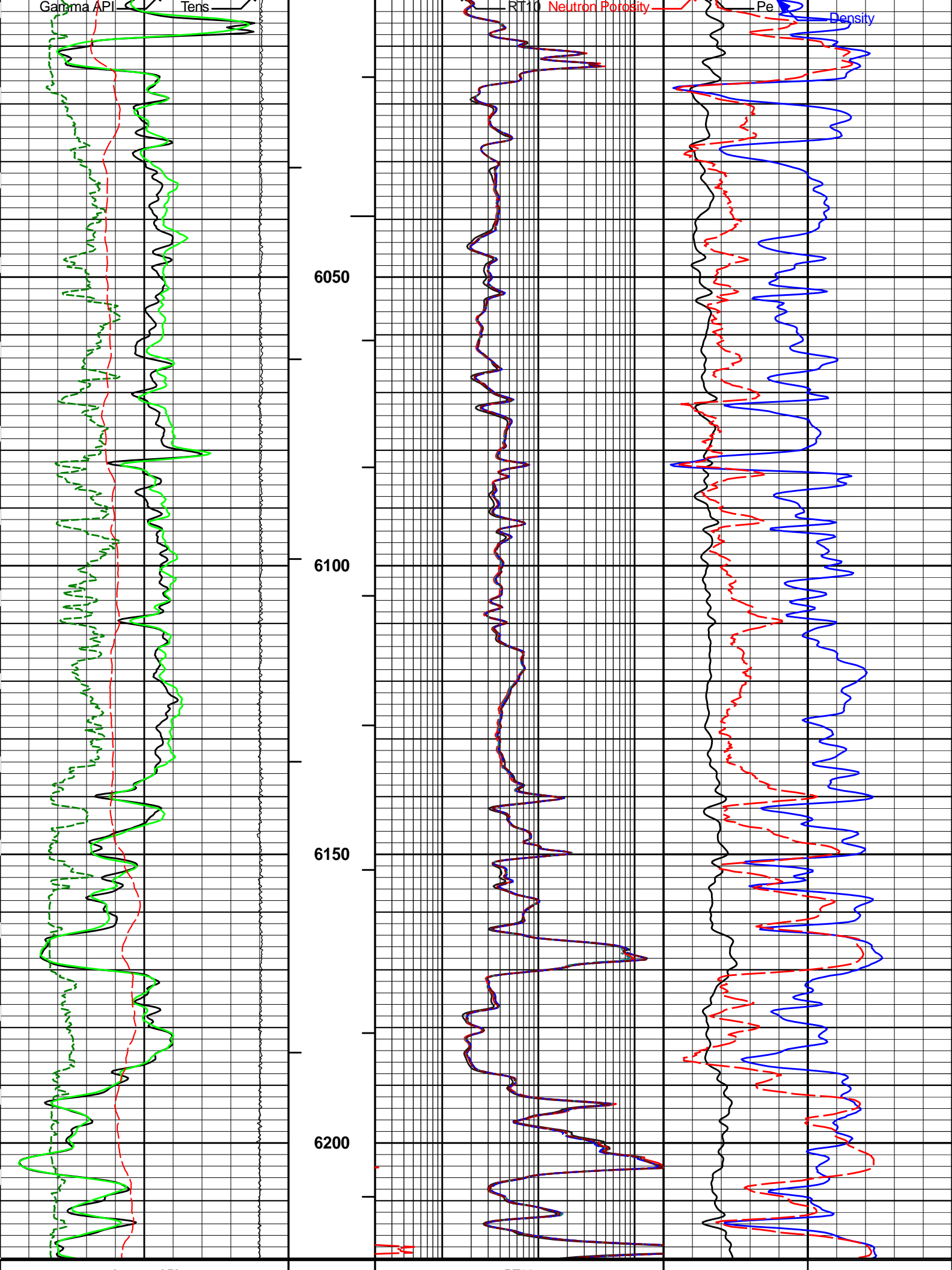
MAIN PASS 5" = 100'

HALLIBURTON Plot Time: 01-Aug-14 10:34:32
 Plot Range: 5780 ft to 6220 ft
 Data: HARMON_42-6-17\Well Based\REPEAT\
 Plot File: \COMP\REPEAT

REPEAT PASS 5" = 100'

-200	SP	100		0.2	RT10	200			
	millivolts				ohmm				
12K	Tens	2K		0.2	RT20	200			
	pounds				ohmm				
6	Caliper	16	AHVT	0.2	RT30	200	0.45	Neutron Porosity	-0.15
	inches				ohmm			dec	
0	GammaTotal	200	BHVT	0.2	RT60	200	1.95	Density	2.95
	gapi				ohmm			gram per cc	
0	Gamma API	200	1 : 240	0.2	RT90	200	0	Pe	10
	gapi				ohmm			barns/electron	





0	Gamma API	200	1 : 240	0.2	RT90	200	0	Pe	10
	gapi				ohmm			barns/electron	
0	GammaTotal	200	BHVT	0.2	RT60	200	1.95	Density	2.95
	gapi				ohmm			gram per cc	
6	Caliper	16	AHVT	0.2	RT30	200	0.45	Neutron Porosity	-0.15
	inches				ohmm			decP	
12K	Tens	2K		0.2	RT20	200			
	pounds				ohmm				
-200	SP	100		0.2	RT10	200			
	millivolts				ohmm				

<div> <div>HALLIBURTON</div> <div> Plot Time: 01-Aug-14 10:34:34 Plot Range: 5780 ft to 6220 ft Data: HARMON_42-6-17\Well Based\REPEAT\ Plot File: \\COMP\REPEAT </div> </div>									
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REPEAT PASS 5" = 100'

HALLIBURTON
CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION			
Tool Name:	GTET - 11812882	Reference Calibration Date:	02-May-14 08:53:39
Engineer:	J. PINKETT	Calibration Date:	28-Jul-14 11:58:59
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1
Calibrator Source S/N: TB 289 Calibrator API Reference:243.00 api Equivalent Calibrator API Reference:247.3 api			
Measurement	Measured	Calibrated	Units
Background	73.5	72.4	api
Background + Calibrator	324.5	319.6	api
Calibrator	251.0	247.3	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION			
Tool Name:	GTET - 11812882	Reference Calibration Date:	28-Jul-14 11:58:59
Engineer:	J. SCHMIDT	Calibration Date:	31-Jul-14 09:02:18
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1

Calibrator Source S/N: TB 289 Calibrator API Reference:243.00 api Equivalent Calibrator API Reference:247.3 api			
Field Verification	Shop	Field	Units
Background	72.4	37.8	api
Background + Calibrator	319.6	291.4	api
Calibrator	247.3	253.7	api
Shop	Field	Difference	Tolerance
247.3	253.7	-6.4	+/- 9.00

NATURAL GAMMA RAY TOOL POST CALIBRATION				
Tool Name:	GTET - 11812882		Reference Calibration Date:	31-Jul-14 09:02:18
Engineer:	J. SCHMIDT		Calibration Date:	31-Jul-14 14:19:35
Software Version:	WL INSITE R4.2.0 (Build 2)		Calibration Version:	1
Calibrator Source S/N: TB 289				
Calibrator API Reference:243.00 api				
Calibrator API Reference:247.3 api				
Post Verification		Field	Post	Units
Background		37.8	35.9	api
Background + Calibrator		291.4	282.4	api
Calibrator		253.7	246.5	api
Shop	Field	Post	Difference	Tolerance
247.3	253.7	246.5	7.2	+/- 9.00

CSNG-FS SHOP CALIBRATION				
Tool Name:	CSNG - 11212563		Reference Calibration Date:	14-May-14 07:15:19
Engineer:	J. SCHMIDT		Calibration Date:	28-Jul-14 17:03:35
Software Version:	WL INSITE R4.2.0 (Build 2)		Calibration Version:	1
Source SN:	TB 289			

TITANIUM CASE		Measured	Calibrated	Units	
60 KEV Peak Channel #		48.0	48.0	Channel #	
239 KEV Peak Channel #		22.7	22.6	Channel #	
583 KEV Peak Channel #		50.9	50.7	Channel #	
2614 KEV Peak Channel #		208.9	207.5	Channel #	
Calibrate Temperature		57.9	86.4	degF	
Pass/Fail Summary			Centroid		
239 KEV Peak			Passed		
583 KEV Peak			Passed		
2614 KEV Peak			Passed		
Blanket Reference Value: 243.00 API					
Calibrator Value: 276.0 API					
	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1776.5	CPS	335.4	334.5	API
Background	310.9	CPS	59.4	58.6	API
Gamma Ray Gain: 0.95					
Expected Gain Range: 0.85 - 1.15					
Gamma Gain Check: Passed					

CSNG-FS FIELD CALIBRATION				
Tool Name:	CSNG - 11212563		Reference Calibration Date:	28-Jul-14 17:03:35
Engineer:	J. SCHMIDT		Calibration Date:	28-Jul-14 17:15:15
Software Version:	WL INSITE R4.2.0 (Build 2)		Calibration Version:	1
Source SN:				

TITANIUM CASE	Shop	Field	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	22.6	22.7	Channel #
583 KEV Peak Channel #	50.7	50.7	Channel #
2614 KEV Peak Channel #	207.5	207.9	Channel #
Calibrate Temperature	86.4	92.3	degF

Pass/Fail Summary	Centroid
239 KEV Peak	Passed
583 KEV Peak	Passed
2614 KEV Peak	Passed

Blanket Reference Value: 243.00 API
 Calibrator Value: 276.0 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1786.2	CPS	334.5	333.2	API
Background	307.0	CPS	58.6	57.3	API

Gamma Ray Gain: 0.94
 Expected Gain Range: 0.85 - 1.15
 Gamma Gain Check: Passed

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	DSNT - 11301132	Reference Calibration Date:	22-Jul-14 10:56:28
Engineer:	P. DIMPFL	Calibration Date:	22-Jul-14 11:09:14
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1

Logging Source S/N: DSN 434
 Tank Serial Number: 00000001
 Reference value assigned to Tank: 52.750
 Snow Block S/N: BRIGHTON SNOW BLOCK
 Calibration Tank Water Temperature: 75 degF
 Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value

Gain:	0.988	0.984	0.900 - 1.100
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WATER TANK SUMMARY (Horizontal Water Tank)				
Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change
Porosity (decp):	0.2180	0.2169	0.0011	+/- 0.0020
Calibrated Ratio:	9.97	9.93	0.038	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0768	0.02000 - 0.09000

PASS/FAIL SUMMARY	
Background Check:	Passed
Gain-Range Check:	Passed

Snow-Block Check:

Passed

DUAL SPACED NEUTRON FIELD CALIBRATION**Tool Name:** DSNT - 11301132**Reference Calibration Date:** 22-Jul-14 11:09:14**Engineer:** J. SCHMIDT**Calibration Date:** 31-Jul-14 04:32:47**Software Version:** WL INSITE R4.2.0 (Build 2)**Calibration Version:** 1

Logging Source S/N: DSN 434

Snow Block S/N: BRIGHTON SNOW BLOCK

NEUTRON FIELD-CHECK SUMMARY

	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0768	0.0742	-0.0026	+/- 0.0150

PASS/FAIL SUMMARY

Block Change Check: Passed

Snow Block Stat Check: Passed

Temperature Check: Passed

DUAL SPACED NEUTRON POST CALIBRATION**Tool Name:** DSNT - 11301132**Reference Calibration Date:** 31-Jul-14 04:32:47**Engineer:** J. SCHMIDT**Calibration Date:** 31-Jul-14 14:28:17**Software Version:** WL INSITE R4.2.0 (Build 2)**Calibration Version:** 1

Logging Source S/N: DSN 434

Snow Block S/N: BRIGHTON SNOW BLOCK

NEUTRON POST-CHECK SUMMARY

	Field Value	Post Value	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0742	0.0681	-0.0061	+/- 0.0150

PASS/FAIL SUMMARY

Block Change Check: Passed

Snow Block Stat Check: Passed

Temperature Check: Passed

DENSITY CALIPER SHOP CALIBRATION**Tool Name:** SDLT - 11107335**Reference Calibration Date:** 02-May-14 10:37:18**Engineer:** P. DIMPFL**Calibration Date:** 24-Jul-14 11:25:45**Software Version:** WL INSITE R4.2.0 (Build 2)**Calibration Version:** 1**Host Tool Name:** DSNT - 11301132**CALIBRATION COEFFICIENTS**

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-3568.16	-3274.88	-7000.00 - -1000.00
Pad Gain	0.0003902	0.0003815	0.000200 - 0.000600
Arm Offset	-3514.77	-3667.63	-5000.00 - 3000.00
Arm Gain	0.0005739	0.0005711	0.000300 - 0.000700
Arm Power	-0.000006426	-0.000006108	-0.000010000 - 0.000010000

The ring diameter is computed from: DIAMETER = PAD EXTENSION + ARM EXTENSION + TOOL DIAMETER

Tool Diameter: 4.50 in

CALIBRATION RINGS

Measurement	Current Reading (Previous Coeff.)	Calibrated (New Coeff.)	Change	Control Limit On New Value
PAD EXTENSION:				

Small Ring (in)	1.93	2.00	0.07	+/- 0.20
Medium Ring (in)	3.72	3.75	0.03	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.47	6.50	0.03	+/- 0.20
Medium Ring (in)	8.22	8.25	0.03	+/- 0.20
Large Ring (in)	14.91	15.00	0.09	+/- 0.20

PASS/FAIL SUMMARY	
Calibration-Coefficients Range Check:	Passed
Ring-Measurement Check:	Passed
PASS/FAIL SUMMARY	
Calibration-Coefficients Range Check:	Passed

SDLT CALIPER FIELD CALIBRATION

Tool Name:	SDLT - 11107335	Reference Calibration Date:	24-Jul-14 11:25:45
Engineer:	J. SCHMIDT	Calibration Date:	31-Jul-14 04:36:26
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1

MEASURED CALIPER VALUES				
Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.80	0.05	+/- 0.10
Ring Diameter	8.25	8.13	-0.12	+/- 0.15

PASS/FAIL SUMMARY	
Pad Extension Check:	Passed
Diameter Check:	Passed

SDLT CALIPER POST CALIBRATION

Tool Name:	SDLT - 11107335	Reference Calibration Date:	31-Jul-14 04:36:26
Engineer:	J. SCHMIDT	Calibration Date:	31-Jul-14 15:19:30
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1

MEASURED CALIPER VALUES				
Measurement	Field	Post	Change	Control Limit On New Value
Pad Extension	3.80	3.79	-0.01	+/- 0.10
Ring Diameter	8.13	8.25	0.11	+/- 0.15

PASS/FAIL SUMMARY	
Pad Extension Check:	Passed
Diameter Check:	Passed

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name:	SDLT Pad - 11045470	Reference Calibration Date:	22-Jul-14 14:52:56
Engineer:	P. DIMPFL	Calibration Date:	22-Jul-14 15:15:51
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1

Logging Source S/N: 5471GW		
Aluminum Block S/N: 63094	Density: 2.608g/cc	Pe: 3.230
Magnesium Block S/N: 63387	Density: 1.681g/cc	Pe: 2.600

DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Aluminum Density	1.6825	1.6824	±0.001
Magnesium Density	2.6025	2.6024	±0.001

Near Bar Gain	1.0695	1.0681	0.90 - 1.10
Near Dens Gain	1.0355	1.0280	0.90 - 1.10
Near Peak Gain	1.0440	1.0234	0.90 - 1.10
Near Lith Gain	1.0161	0.9888	0.90 - 1.10
Far Bar Gain	1.0117	1.0132	0.90 - 1.10
Far Dens Gain	1.0007	1.0028	0.90 - 1.10
Far Peak Gain	0.9940	0.9974	0.90 - 1.10
Far Lith Gain	0.9800	0.9762	0.90 - 1.10

Near Bar Offset	-0.6700	-0.6600	NONE
Near Dens Offset	-0.3123	-0.2498	NONE
Near Peak Offset	-0.3683	-0.1978	NONE
Near Lith Offset	-0.1578	0.0673	NONE
Far Bar Offset	-0.1816	-0.1971	NONE
Far Dens Offset	-0.0712	-0.0923	NONE
Far Peak Offset	-0.0266	-0.0581	NONE
Far Lith Offset	0.0600	0.0928	NONE

Near Bar Background	986.31	988.38	700 - 1450
Near Dens Background	326.26	324.88	230 - 480
Near Peak Background	142.93	142.13	100 - 210
Near Lith Background	172.46	172.09	125 - 260
Far Bar Background	523.05	522.95	450 - 900
Far Dens Background	205.66	205.40	175 - 345
Far Peak Background	82.01	82.26	70 - 140
Far Lith Background	84.56	84.65	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.685	1.681	-0.004	+/- 0.015
Pe	2.513	2.568	0.055	+/- 0.150
ALUMINUM				
Density (g/cc)	2.607	2.608	0.002	+/- 0.01500
Pe	3.189	3.189	0.000	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0007	+/- 0.0110	0.0011	+/- 0.0140
Magnesium Block	-0.0002	+/- 0.0110	-0.0015	+/- 0.0140
Aluminum Block	-0.0008	+/- 0.0110	0.0030	+/- 0.0140
Resolution	8.89	6.00 - 11.50	9.11	6.00 - 11.50
Internal Verifier(B+D+P+L)	1627	1200 - 2700	895	800 - 1700

PASS/FAIL SUMMARY	
Background Quality Check:	Passed
Background Range Check:	Passed
Background Resolution Check:	Passed
Background Verification Check:	Passed
Magnesium Quality Check:	Passed
Aluminum Quality Check:	Passed

Aluminum Quality Check:		Passed	
Gains Check:		Passed	
Changes in Calibration Blocks:		Passed	

SPECTRAL DENSITY FIELD CHECK			
Tool Name:	SDLT Pad - 11045470	Reference Calibration Date:	22-Jul-14 15:15:51
Engineer:	J. SCHMIDT	Calibration Date:	31-Jul-14 04:29:50
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1

Pad Temperature: 61.1 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1627.468	1621.285	-6.183	16.214
Far (B+D+P+L) cps	895.263	899.144	3.881	16.284
Near Resolution	8.89	9.05	0.160	0.50
Far Resolution	9.11	9.36	0.250	1.00

PASS/FAIL SUMMARY	
Bkg Quality Check:	Passed
Bkg Resolution Check:	Passed
Bkg Verification Check:	Passed

SPECTRAL DENSITY POST CHECK			
Tool Name:	SDLT Pad - 11045470	Reference Calibration Date:	31-Jul-14 04:29:50
Engineer:	J. SCHMIDT	Calibration Date:	31-Jul-14 14:16:49
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1

Pad Temperature: 78.8 degF

DENSITY POST CALIBRATION SUMMARY				
Measurement	Field	Post	Change	Control Limit +/-
Near (B+D+P+L) cps	1621.285	1629.724	8.439	16.214
Far (B+D+P+L) cps	899.144	895.028	-4.116	16.284
Near Resolution	9.05	8.85	-0.200	0.50
Far Resolution	9.36	9.24	-0.120	1.00

PASS/FAIL SUMMARY	
Bkg Quality Check:	Passed
Bkg Resolution Check:	Passed
Bkg Verification Check:	Passed

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION			
Tool Name:	ACRt Sonde - 11294352	Reference Calibration Date:	14-Apr-14 16:30:23
Engineer:	J. SCHMIDT	Calibration Date:	13-May-14 19:32:36
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1
Host Tool Name:	ACRt Instrument - 11296758		

TYPICAL GAIN RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0036	1.05	0.95	1.0042	1.05	0.95	1.0008	1.05
A2 (50")	0.95	1.0097	1.05	0.95	1.0115	1.05	0.95	1.0100	1.05
A3 (29")	0.95	1.0041	1.05	0.95	1.0062	1.05	0.95	1.0038	1.05
A4 (17")	0.95	1.0064	1.05	0.95	1.0058	1.05	0.95	1.0049	1.05

A5 (10")	N/A	N/A	N/A	0.95	1.0167	1.05	0.95	1.0147	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9888	1.05	0.95	0.9868	1.05
SONDE OFFSET									
Subarray	R12KHz			R36KHz			R72KHz		
	(mmho/m)			(mmho/m)			(mmho/m)		
A1 (80")	-0.879			-4.050			-5.223		
A2 (50")	-2.717			-3.905			-4.528		
A3 (29")	-14.094			-4.079			-3.217		
A4 (17")	-97.571			-31.233			-25.267		
A5 (10")	N/A			-104.789			-49.852		
A6 (6")	N/A			320.612			162.677		
TRANSMITTER CURRENT GAIN					R-MUD VERIFICATION				
Signal	Lower	R	Upper		Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)	
12K	0.6	0.84	1.3		Mud Cell	0.95	0.98	1.05	
36K	1.0	1.85	2.0						
72K	1.0	1.09	2.0						
PASS/FAIL SUMMARY									
GAIN RANGE CHK					PASS				
SONDE OFFSET CHK					PASS				
TOOL OK TO LOG									
CALIBRATION SUMMARY									
Sensor	Shop	Field	Post	Difference	Tolerance	Units			
GTET-11812882									
Gamma Ray Calibrator	247.3	253.7	246.5	7.2	+/- 9.00	api			
CSNG-11212563									
60 KEV Peak Channel #	48.0	48.0	-----	0.0	-----	Channel #			
239 KEV Peak Channel #	22.6	22.7	-----	-0.1	-----	Channel #			
583 KEV Peak Channel #	50.7	50.7	-----	0.0	-----	Channel #			
2614 KEV Peak Channel #	207.5	207.9	-----	-0.4	-----	Channel #			
DSNT-11301132									
Snow-Block Porosity	0.0768	0.0742	0.0681	0.0061	+/- 0.0150	decp			
SDLT-11107335									
Pad Extension	3.75	3.80	3.79	0.01	+/-0.10	in			
Ring Diameter	8.25	8.13	8.25	-0.12	+/-0.15	in			
SDLT Pad-11045470									
Near(B+D+P+L)	1627.468	1621.285	1629.724	-8.439	+/-16.214	cps			
Far(B+D+P+L)	895.263	899.144	895.028	4.116	+/-16.284	cps			
ACRt Sonde-11294352									
Mud Cell	0.98	-----	-----	0.00	-----	ohm-m			
Date: HARMON 42 6 170002 TC CSNCVBLE									
Date: 01 Aug 14 00:47:44									
HALLIBURTON									
TOOL STRING DIAGRAM REPORT									
Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length			
						63.65 ft			

RWCH-10895163
135.00 lbs

Ø 3.625 in →

← Load Cell @ 59.96 ft
← BH Temperature @ 59.40 ft

6.25 ft

57.40 ft

GTET-11812882
165.00 lbs

Ø 3.625 in →

← GammaRay @ 51.33 ft

8.52 ft

48.88 ft

CSNG-11212563
114.00 lbs

UnivWearRing3.6-
00000001
5.00 lbs

Ø 4.200 in*
Ø 3.625 in →

← CSNG @ 43.25 ft

8.17 ft

40.71 ft

DSNT-11301132
174.00 lbs

DSN Decentralizer-
11277440
6.60 lbs

Ø 5.000 in*
Ø 3.625 in →

← DSN Far @ 33.77 ft
← DSN Near @ 33.02 ft

9.69 ft

31.02 ft

SDLT-11107335
360.00 lbs

SDLT Pad-11045470
65.00 lbs

Ø 4.500 in →
Ø 4.750 in* →

← SDL Caliper @ 23.03 ft
← SDL @ 23.02 ft

10.81 ft

20.21 ft

ACRt Instrument-
11296758
50.00 lbs

Regal Standoff 6_75-
00000001
20.00 lbs

Ø 3.625 in
Ø 5.000 in* →

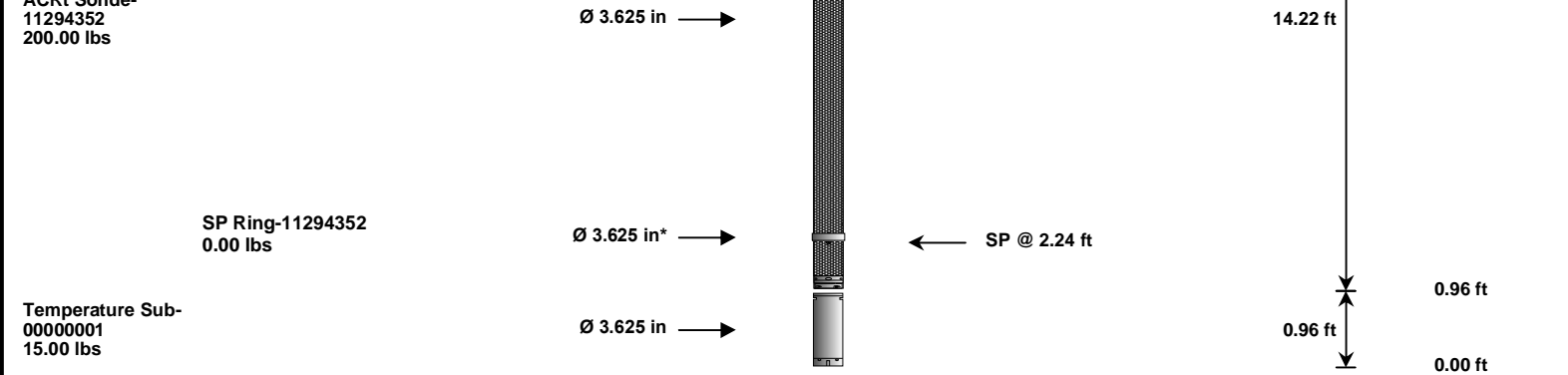
5.03 ft

15.18 ft

← Mud Resistivity @ 13.82 ft

← ACRt @ 9.84 ft

ACRt Sonda



Mnemonic		Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head		10895163	135.00	6.25	57.40	300.00
GTET	Gamma Telemetry Tool		11812882	165.00	8.52	48.88	60.00
CSNG	Compensated Spectral Natural Gamma		11212563	114.00	8.17	40.71	15.00
UWR3P6	Universal Wear Ring 3 5-8 inch		00000001	5.00	0.35	* 44.79	300.00
DSNT	Dual Spaced Neutron		11301132	174.00	9.69	31.02	60.00
DCNT	DSN Decentralizer		11277440	6.60	5.13	* 34.35	300.00
SDLT	Spectral Density Tool		11107335	360.00	10.81	20.21	60.00
SDLP	Density Insite Pad		11045470	65.00	2.55	* 22.42	60.00
ACRt	Array Compensated True Resistivity Instrument Section		11296758	50.00	5.03	15.18	120.00
RSOF	Regal Standoff 6.75in		00000001	20.00	0.52	* 17.26	300.00
ACRt	Array Compensated True Resistivity Sonde Section		11294352	200.00	14.22	0.96	120.00
SP	SP Ring		11294352	0.00	0.25	* 2.24	300.00
TMAX	Temperature Sub - 3_625 OD		00000001	15.00	0.96	0.00	300.00
Total				1,309.60	63.65		
* Not included in Total Length and Length Accumulation.							
Data: HARMON_42-6-170002 TC_CSNG\001 31-Jul-14 09:47 Up @6602.0f						Date: 31-Jul-14 13:08:27	

COMPANY	PIONEER NATURAL RESOURCES USA INC.		
WELL	HARMON 42-6-17-53		
FIELD	WILDCAT		
COUNTY	LINCOLN	STATE	CO
HALLIBURTON		DUAL SPACED NEUTRON SPECTRAL DENSITY ARRAY COMPENSATED TRUE RESISTIVITY	