HALLIBURTON

SPECTRAL DENSITY
DUAL SPACED NEUTRON
ARRAY COMPENSATED
TRUE RESISTIVITY

COMPANY	**NOBLE ENERGY**
WELL	**STATE PC GC36-16**
FIELD	**WATTENBERG**
COUNTY	**WELD**
STATE	**CO**

COMPANY	**NOBLE ENERGY**	
WELL	**STATE PC GC36-16**	
FIELD	**WATTENBERG**	
COUNTY	**WELD**	STATE **CO**
API No.	05123317570000	Other Services: RWCH GTET CSNG BSAT
Location	SHL: 660' FSL & 660' FEL SESE LAT: 40.96056° LONG: -104.26066°	
Sect. 36	Twp. 12N	Rge. 62W

Permanent Datum	GL	Elev. 5273.0 ft	Elev.: K.B.	5285.0 ft
Log measured from	KB	12.0 ft above perm. Datum	D.F.	5285.0 ft
Drilling measured from	KB		G.L.	5273.0 ft

Date		06-Aug-10					
Run No.		ONE					
Depth - Driller		8015.00 ft					
Depth - Logger		8013.0 ft					
Bottom - Logged Interval		8004 ft					
Top - Logged Interval		1270 ft					
Casing - Driller		8.625 in	@ 1269.0 ft		@		@
Casing - Logger		1270.0 ft					
Bit Size		7.875 in			@		@
Type Fluid in Hole		WBM					
Density	Viscosity	9.1 ppg	37.00 s/qt				
PH	Fluid Loss	6.50 pH	10.4 cptm				
Source of Sample		FLOW LINE					
Rm @ Meas. Temperature		0.910 ohmm	@ 99.50 degF		@		@
Rmf @ Meas. Temperature		1.01 ohmm	@ 75.00 degF		@		@
Rmc @ Meas. Temperature		1.053 ohmm	@ 75.00 degF		@		@
Source Rmf	Rmc	CHART	CHART				
Rm @ BHT		0.43 ohmm	@ 217.0 degF		@		@
Time Since Circulation		5.0 hr					
Time on Bottom		07-Aug-10 00:34					
Max. Rec. Temperature		217.0 degF	@ 8013.0 ft		@		@
Equipment	Location	11454566	BRIGHTON				
Recorded By		C. BLUE					
Witnessed By		G. STAPLETON		M. SCANNIELLO			

Fold here

Service Ticket No.: 7543714 API Serial No.: 05123317570000 PGM Version: WL INSITE R3.0.4 (Build 6)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE					
Date	Sample No.				
Depth-Driller					
Type Fluid in Hole					
Density	Viscosity				
Ph	Fluid Loss				
Source of Sample					
Rm @ Meas. Temp		@		@	
Rmf @ Meas. Temp.		@		@	
Rmc @ Meas. Temp.		@		@	
Source Rmf	Rmc				
Rm @ BHT		@		@	
Rmf @ BHT		@		@	
Rmc @ BHT		@		@	

RESISTIVITY SCALE CHANGES			
Type Log	Depth	Scale Up Hole	Scale Down Hole

RESISTIVITY EQUIPMENT DATA				
Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other
ONE	ACRT 758-352	N/A	1.5" S.O.	N/A

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	11277436	Serial No.	1105781	Serial No.	I132M275	Serial No.	11301132
Model No.	GTET	Model No.	BSAT	Model No.	SDLT	Model No.	DSNT
Diameter	3.625"	No. of Cent.	2	Diameter	4.5"	Diameter	3.625"
Detector Model No.	102A`	Spacing	0.5'	Log Type	GAM/GAM	Log Type	NEU/NEU
Type	SCINT			Source Type	Cs137	Source Type	Am241Be
Length	8"	LSA [Y/N]	N	Serial No.	2770 GW	Serial No.	DSN 434
Distance to Source	18'	FWDA [Y/N]	N	Strength	1.5 Ci	Strength	15 Ci

LOGGING DATA

GENERAL	GAMMA	ACOUSTIC	DENSITY	NEUTRON

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	8013	7557	REC	0	250	30%	-10%	55.5 us/ft	20%	0%	2.65 g/cc	20%	0%	SAND
ONE	7557	7230	REC	0	250	30%	-10%	55.5 us/ft	20%	0%	2.68 g/cc	20%	0%	SAND
ONE	7230	6750	REC	0	250	30%	-10%	47.6 us/ft	20%	0%	2.71 g/cc	20%	0%	LIME
ONE	6750	1270	REC	0	250	30%	-10%	55.5 us/ft	20%	0%	2.68 g/cc	20%	0%	SAND

DIRECTIONAL INFORMATION

Maximum Deviation	@	KOP	@

Remarks:

RWCH/GTET/CSNG/DSNT/SDLT/BSAT/ACRT RAN IN COMBINATION

ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH PRODUCTION CASING

TENSION PULLS AFFECT TOOL RESPONSE

CREW: T. BINEAU, J. WALKER, M. BURNETT RIG: FORT 5

THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES -- BRIGHTON, CO -- (303) 825-4346

HALLIBURTON

PARAMETERS REPORT

Depth (ft)	Tool Name	Description	Value	Units
TOP				
	DSNT	Neutron Lithology	Sandstone	
	SDLT	Formation Density Matrix	2.680	g/cc
	BSAT	Delta -T Matrix Type	Sandstone 55.5	
6750.00				
	DSNT	Neutron Lithology	Limestone	
	SDLT	Formation Density Matrix	2.710	g/cc
	BSAT	Delta -T Matrix Type	Limestone 47.5	
7230.00				
	SDLT	Formation Density Matrix	2.680	g/cc
7557.00				
	SHARED	Bit Size	7.875	in
	SHARED	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	Borehole Fluid Weight	9.100	ppg
	SHARED	Oil Based Mud System?	No	
	SHARED	Mud Resistivity	0.910	ohmm
	SHARED	Temperature of Mud	99.5	degF
	SHARED	Logging Interval is Cased?	No	
	SHARED	AHV Casing OD	5.500	in
	SHARED	Surface Temperature	65.0	degF
	SHARED	Total Well Depth	8013.00	ft
	SHARED	Bottom Hole Temperature	217.0	degF
	SHARED	Navigation and Survey Master Tool	NONE	
	SHARED	High Res Z Accelerometer Master Tool	GTET	

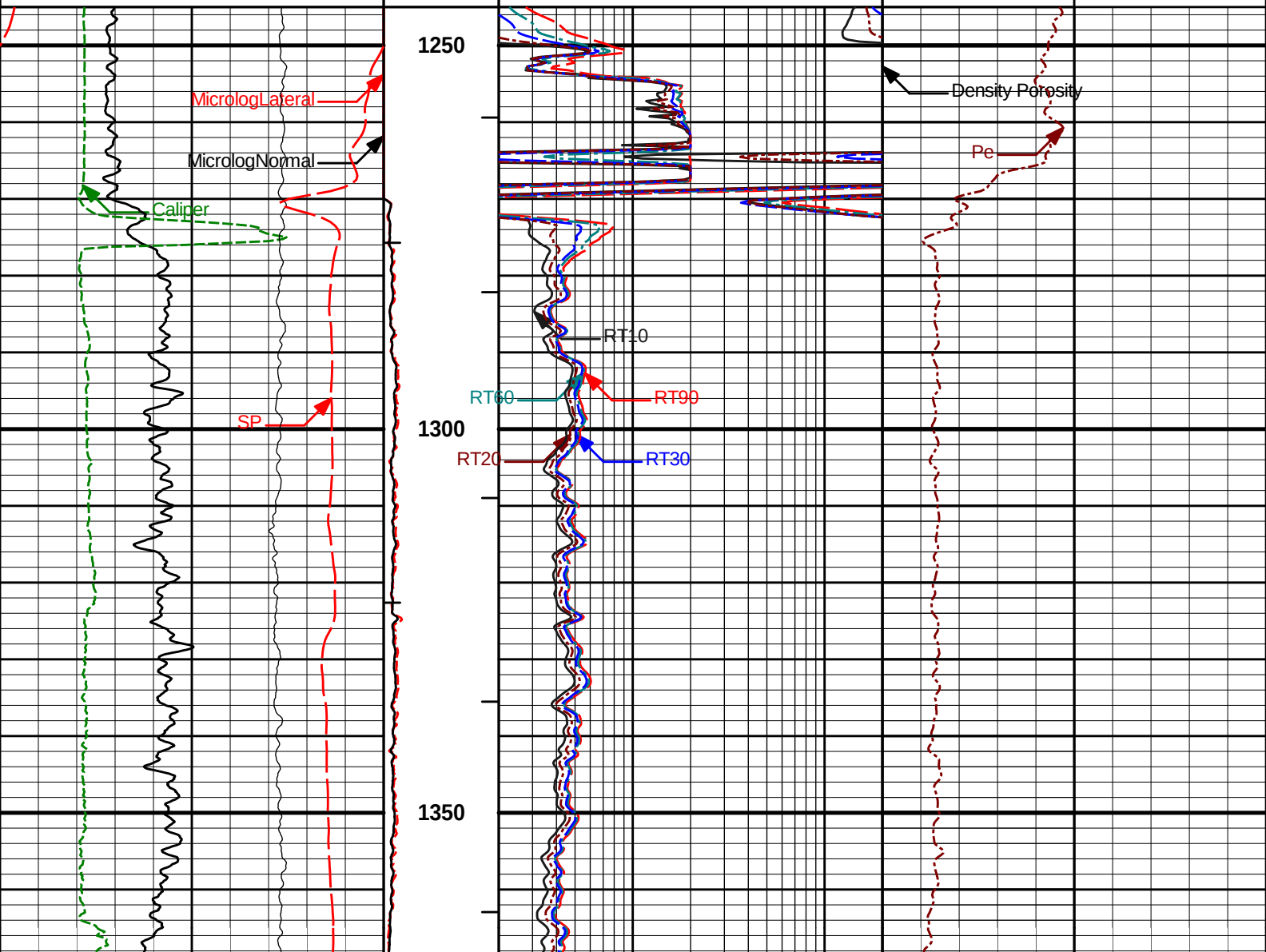
SHARED	Temperature Master Tool	NONE	
SHARED	Borehole Size Master Tool	NONE	
GTET	Process Gamma Ray?	Yes	
GTET	Gamma Tool Standoff	0.000	in
GTET	Process Gamma Ray EVR?	No	
GTET	Potassium	0.00	%
GTET	Mud Type	Natural	
GTET	Tool Position	Standoff	
CSNG	Process CSNG Data?	Yes	
CSNG	Is Tool Centralized?	No	
CSNG	Mud Type?	Natural	
CSNG	Percent K in Mud by Weight?	0.00	%
CSNG	Gamma Enviromental Corrections?	Yes	
CSNG	Barite Correction Factor	1.00	
DSNT	Process DSN?	Yes	
DSNT	Process DSN EVR?	No	
DSNT	Neutron Lithology	Sandstone	
DSNT	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.000	in
DSNT	Temperature Correction Type	None	
DSNT	DSN Pressure Correction Type	None	
DSNT	View More Correction Options	No	
DSNT	Use TVD for Gradient Corrections?	No	
DSNT	Logging Horizontal Water Tank?	No	
SDLT	Process Density?	Yes	
SDLT	Process Density EVR?	No	
SDLT	Is Hole Air Drilled?	No	
SDLT	Logging Calibration Blocks?	No	
SDLT	SDLT Pad Temperature Valid?	Yes	
SDLT	Disable temperature warning	No	
SDLT	Weighted Mud Correction Type?	None	
SDLT	Formation Density Matrix	2.650	g/cc
SDLT	Formation Density Fluid	1.000	g/cc
SDLT	Process Caliper Outputs?	Yes	
SDLT	Process MicroLog Outputs?	Yes	
BSAT	Compute BCAS Results?	Yes	
BSAT	Semblance Filter Low Pass Value?	5000	Hz
BSAT	Semblance Filter High Pass Value?	27000	Hz
BSAT	Delta -T Fluid	189.00	uspf
BSAT	Delta -T Matrix Type	Sandstone 55.5	
BSAT	Delta -T Shale	100.00	uspf
BSAT	Acoustic Porosity Equation	Wylie	
ACRt	Process ACRt?	Yes	
ACRt	Minimum Tool Standoff	1.50	in
ACRt	Temperature Correction Source	FP Lwr & FP Upr	
ACRt	Tool Position	Free Hanging	
ACRt	Rmud Source	Mud Cell	
ACRt	Minimum Resistivity for MAP	0.20	ohmm
ACRt	Maximum Resistivity for MAP	200.00	ohmm
ACRt	Threshold Quality	0.50	

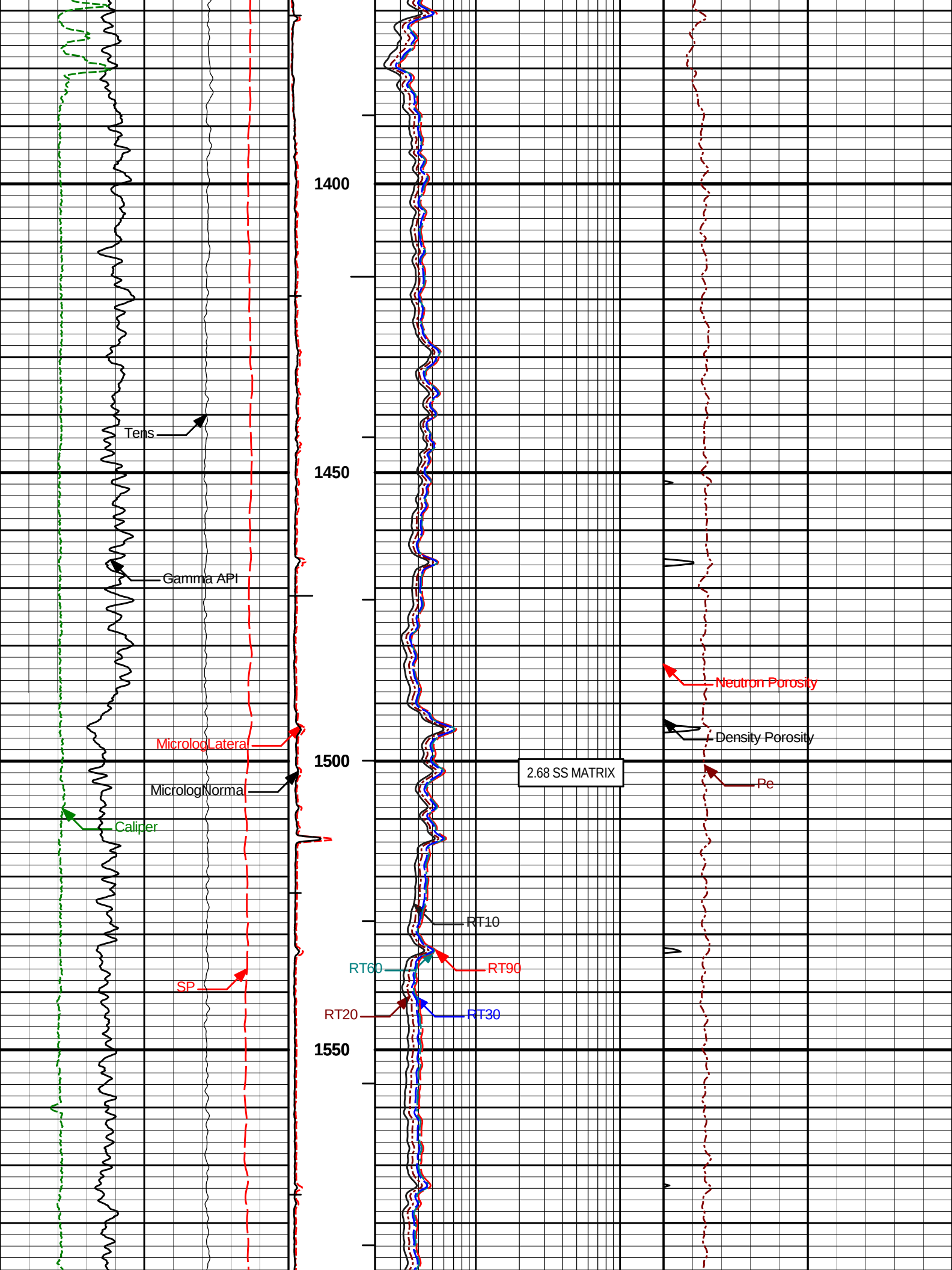
BOTTOM

Plot File: \\COMP\MAIN

MAIN PASS 5" = 100'

Track 1	Depth Track	Track 2	Track 5	Track 3
	MicrologNormal 0 30 ohm-metre	2 **RT10** 200 Ohm-m		
10K Tens 0 pounds	MicrologLateral 0 30 ohm-metre	2 **RT20** 200 Ohm-m		
6 **Caliper** 16 inches	**AHVT**	2 **RT30** 200 Ohm-m	20 **Neutron Porosity** 0 percent	
0 **Gamma API** 250 api	**BHVT**	2 **RT60** 200 Ohm-m	20 **Density Porosity** 0 percent	
50 **SP** 150 millivolts	1 : 240	2 **RT90** 200 Ohm-m	0 **Pe** 10	

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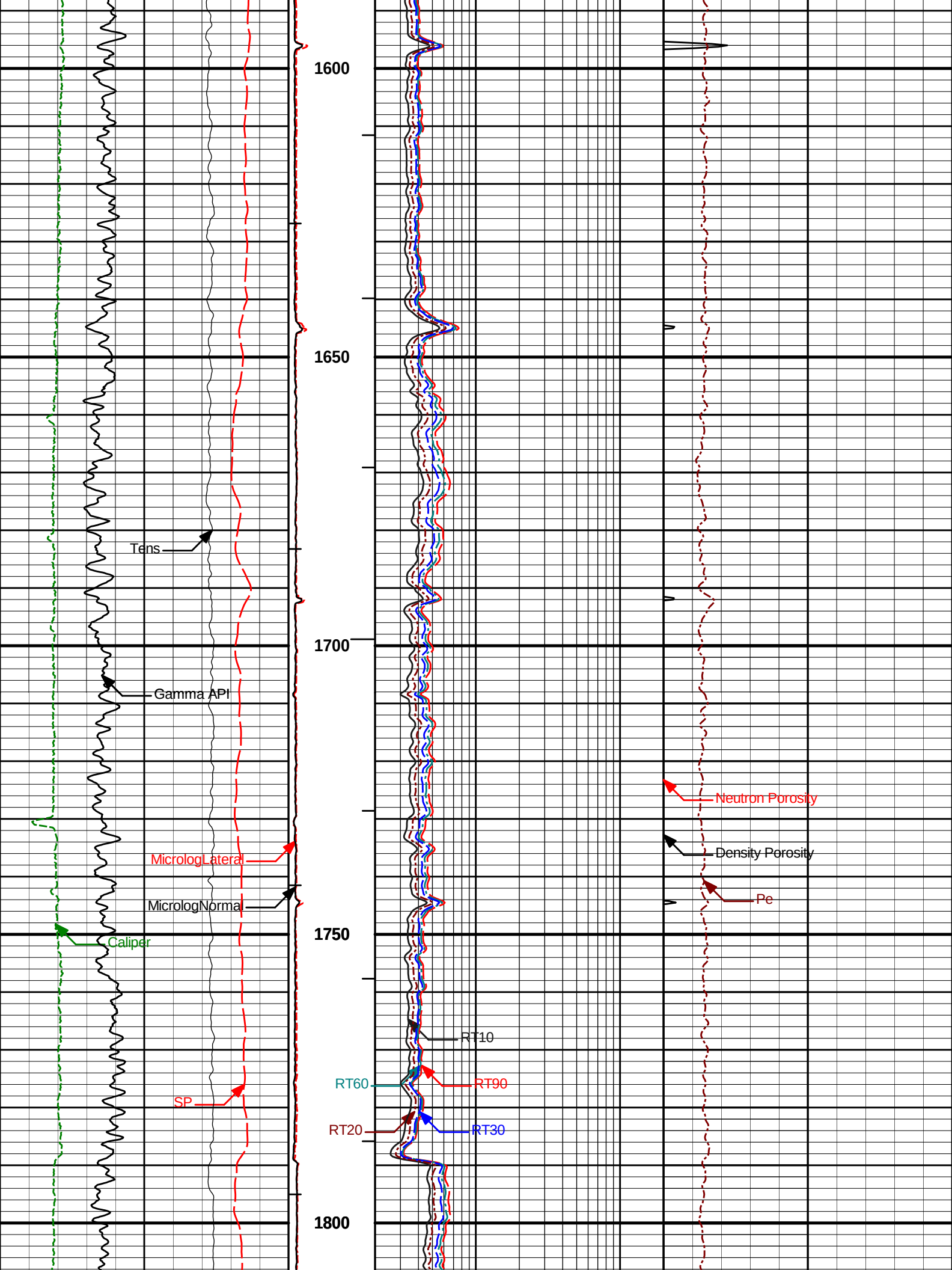
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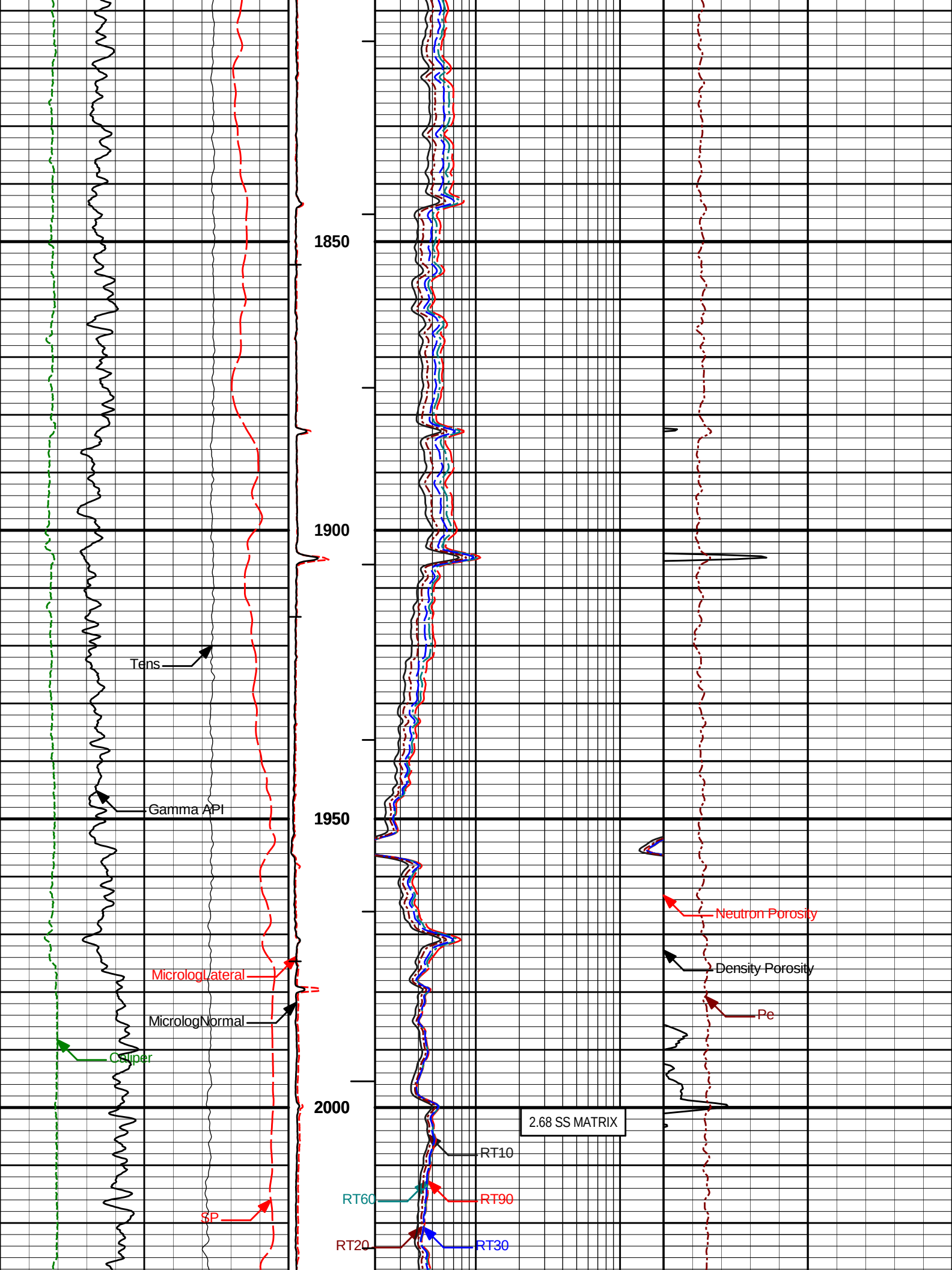
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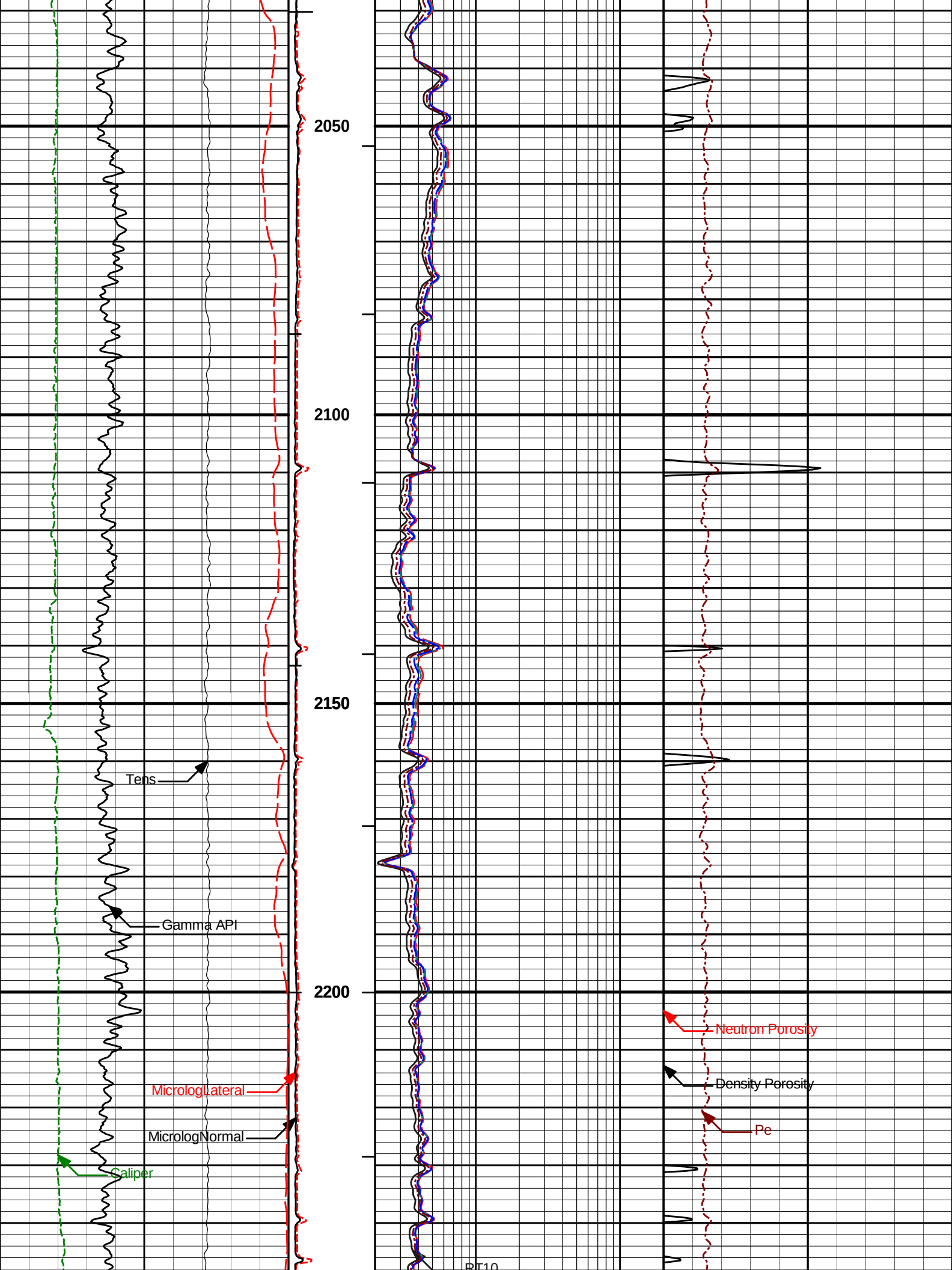
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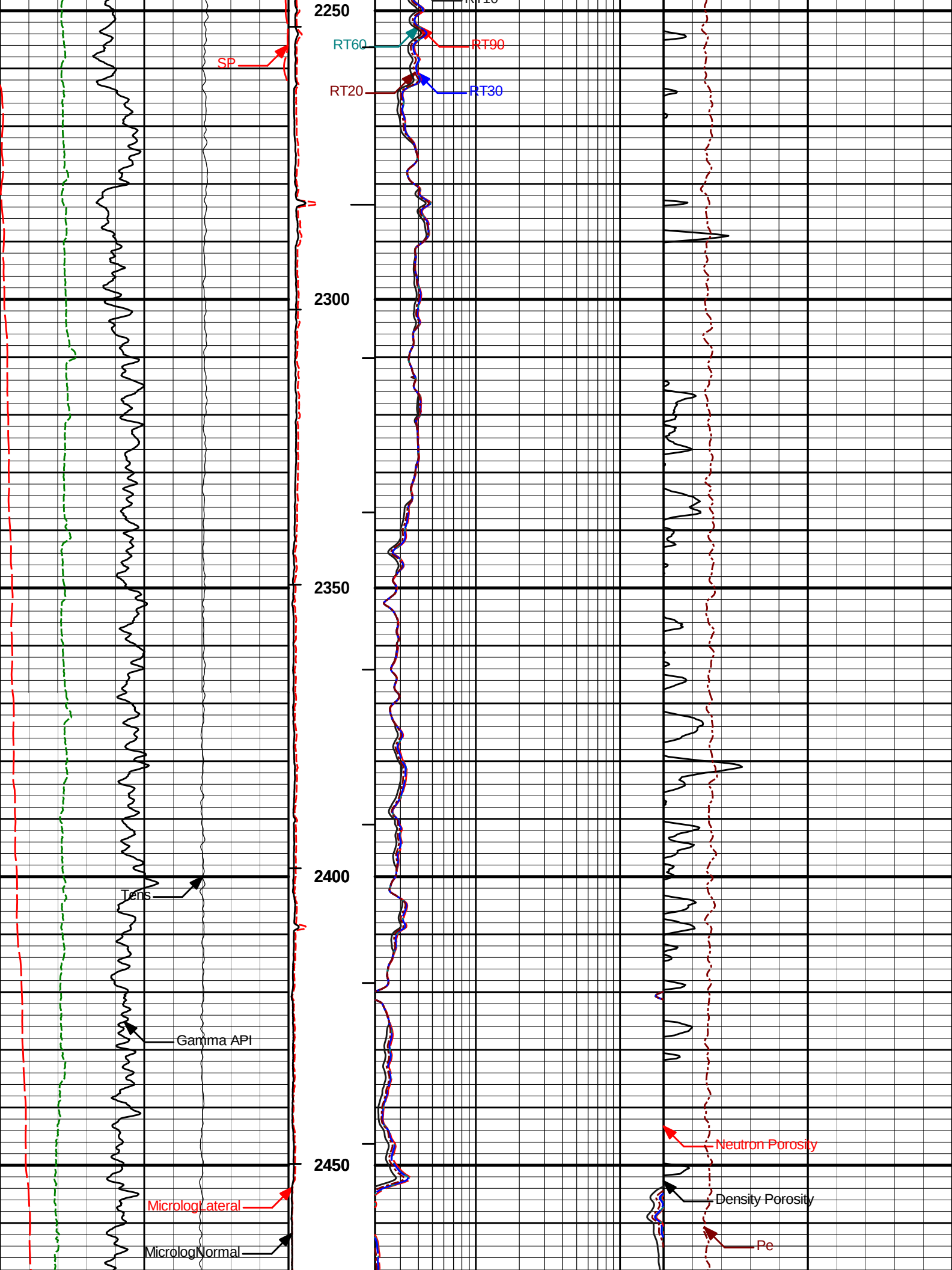
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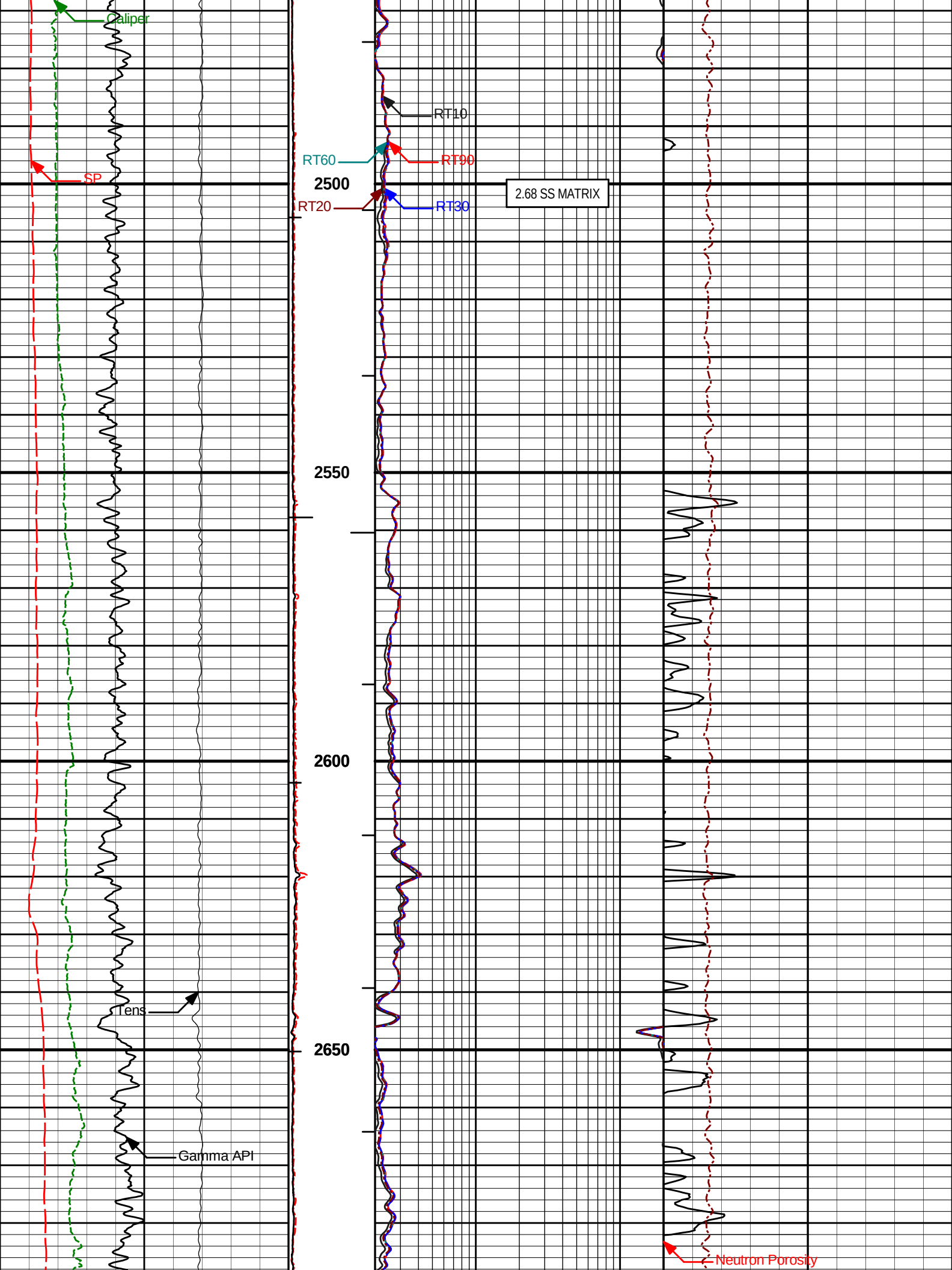
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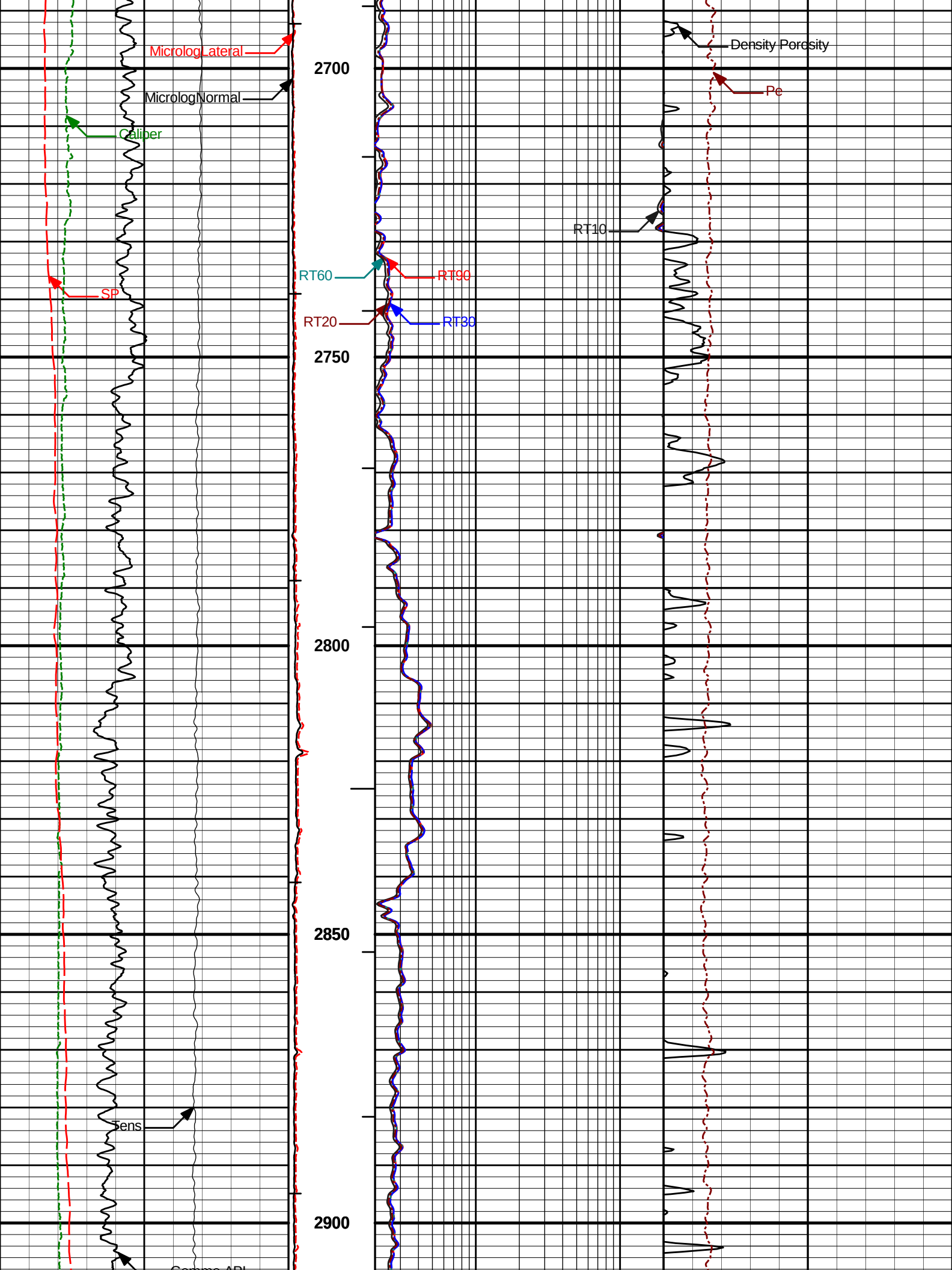
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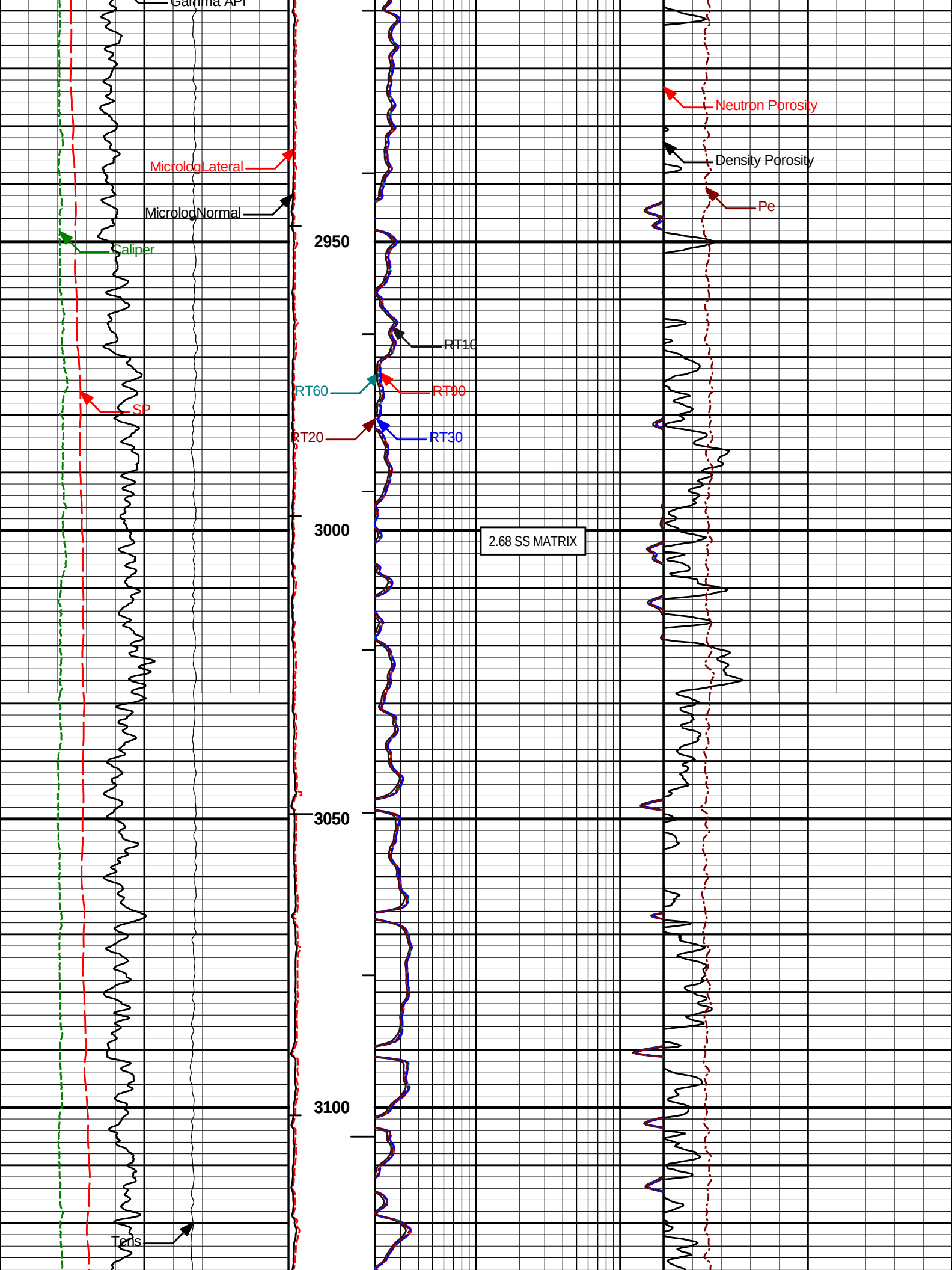
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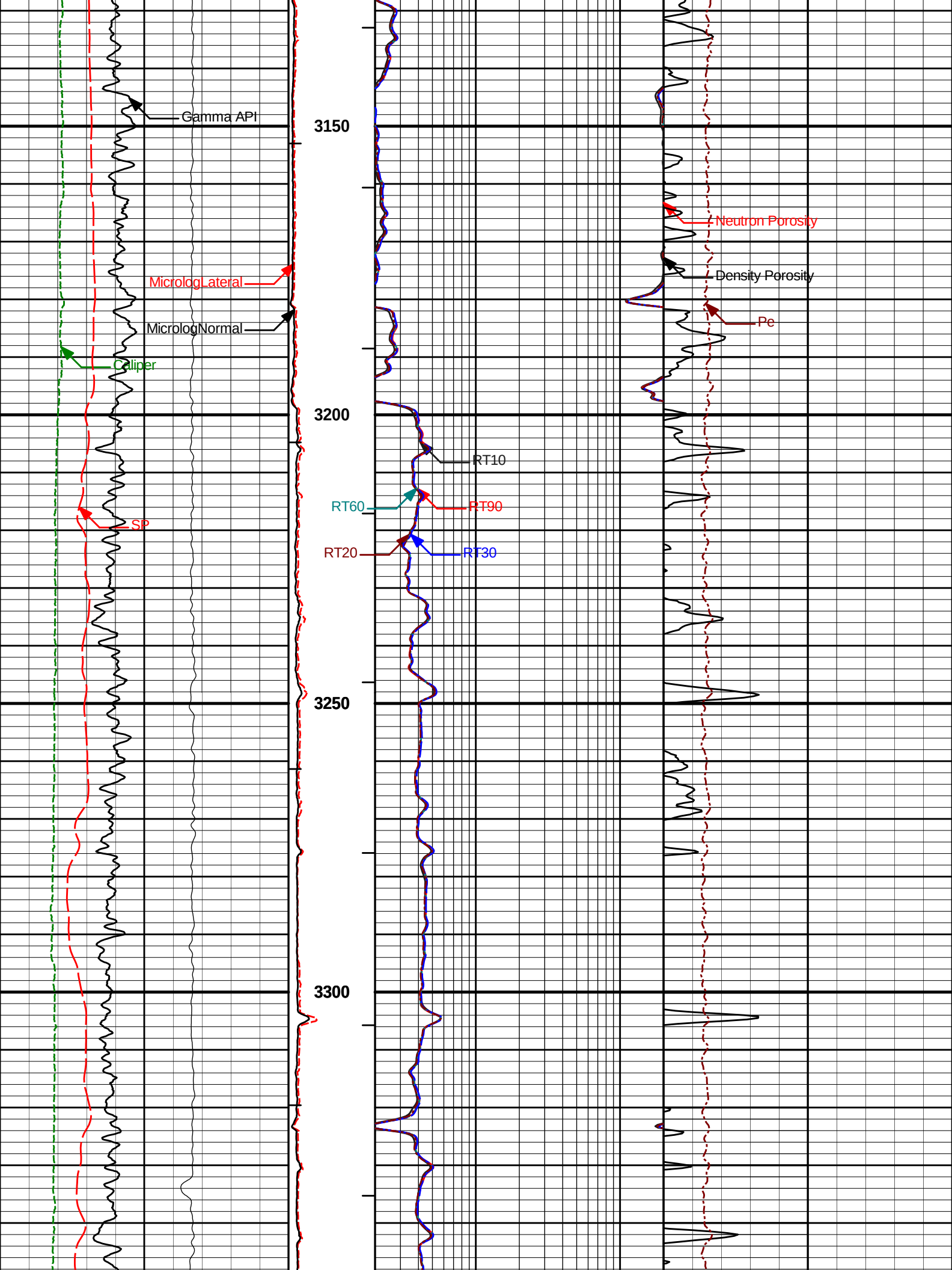
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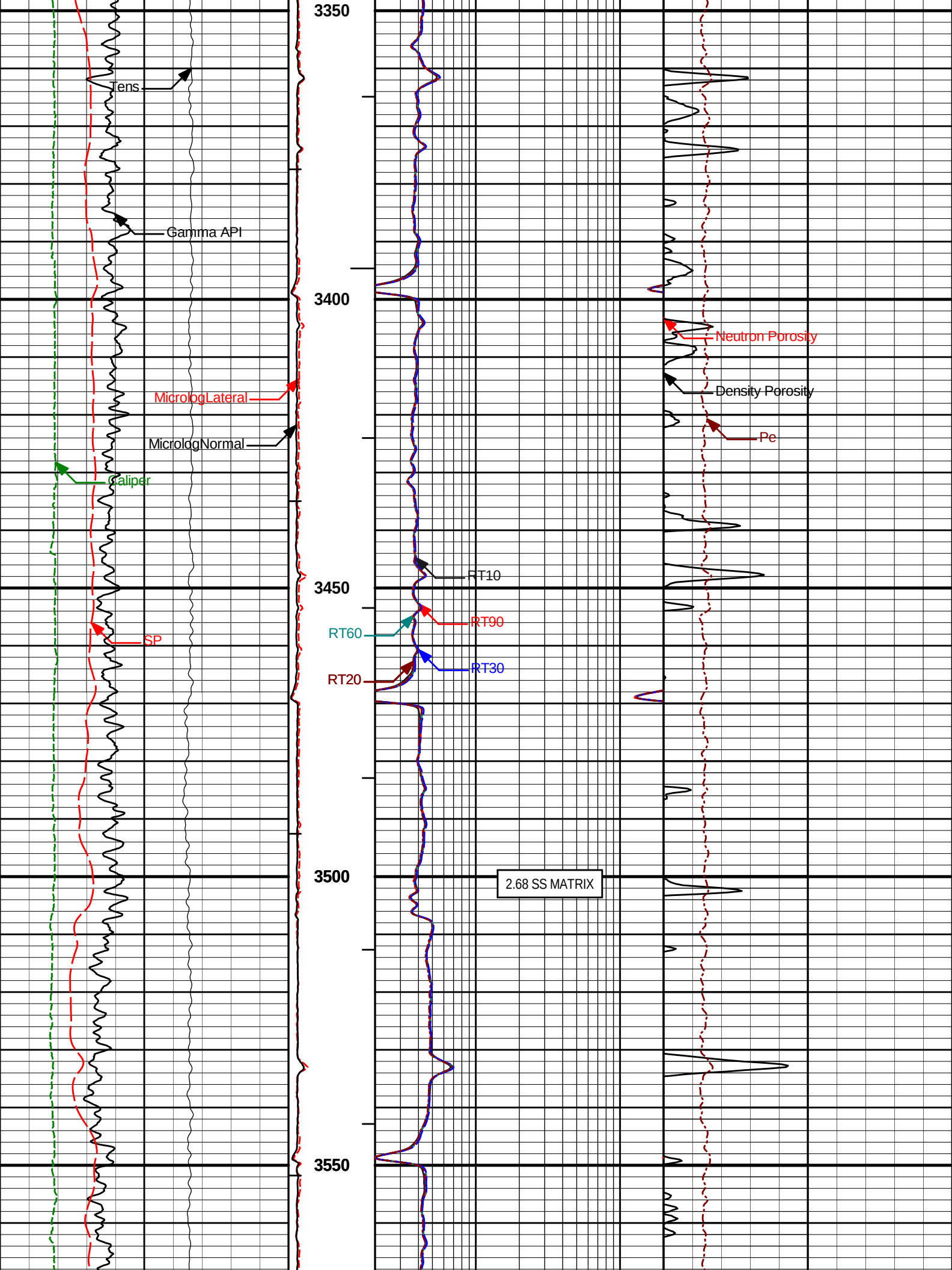
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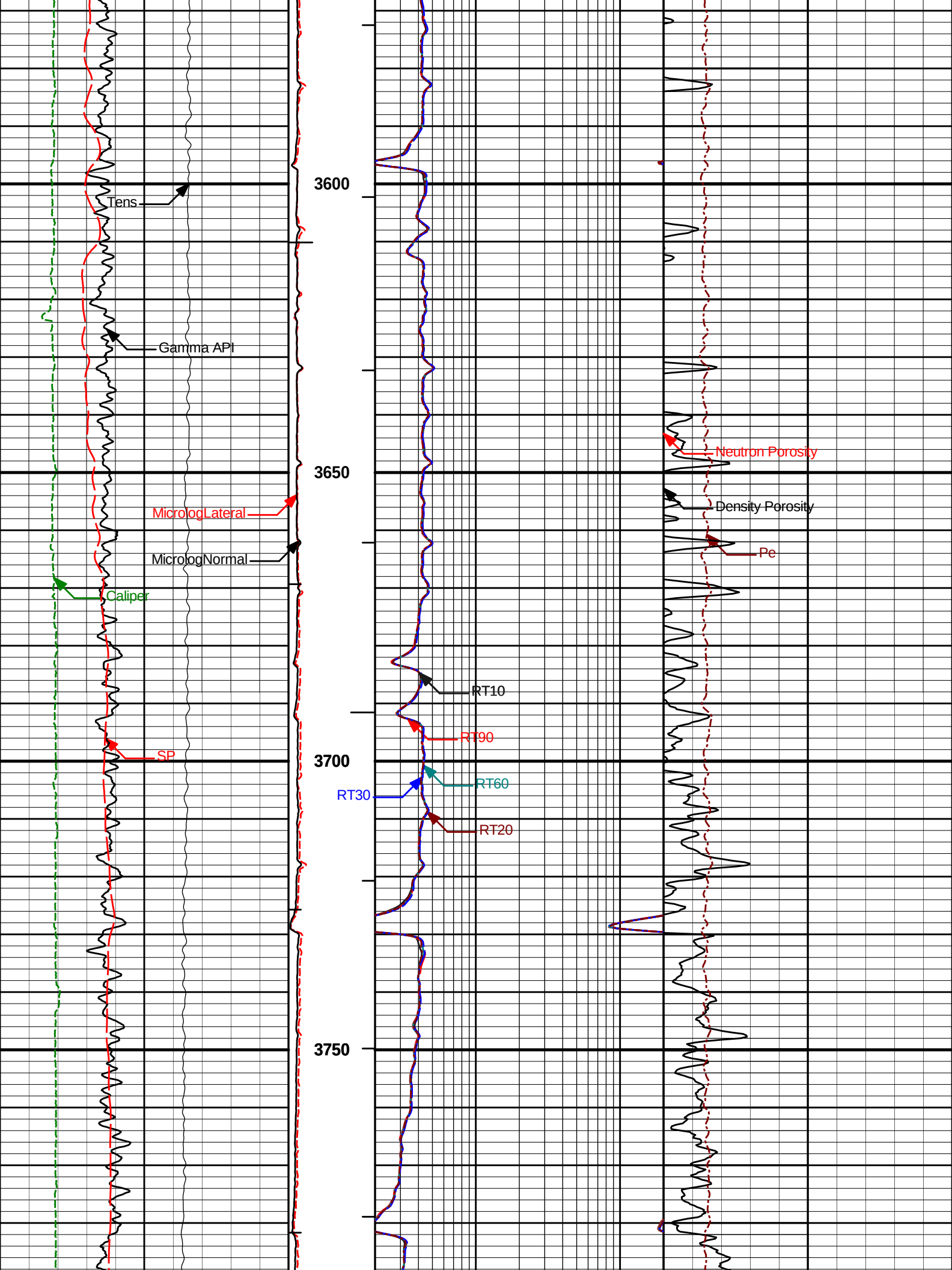
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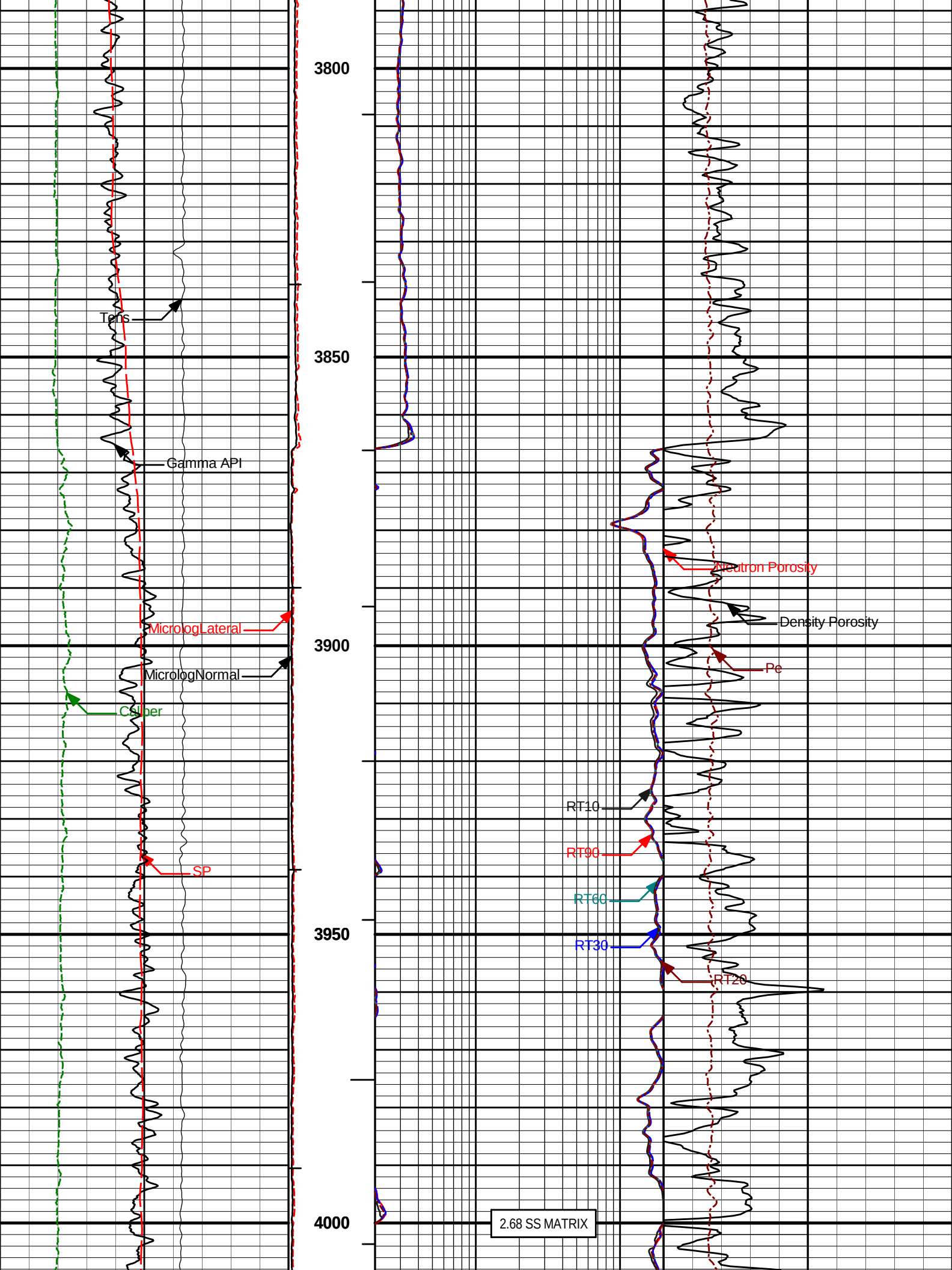
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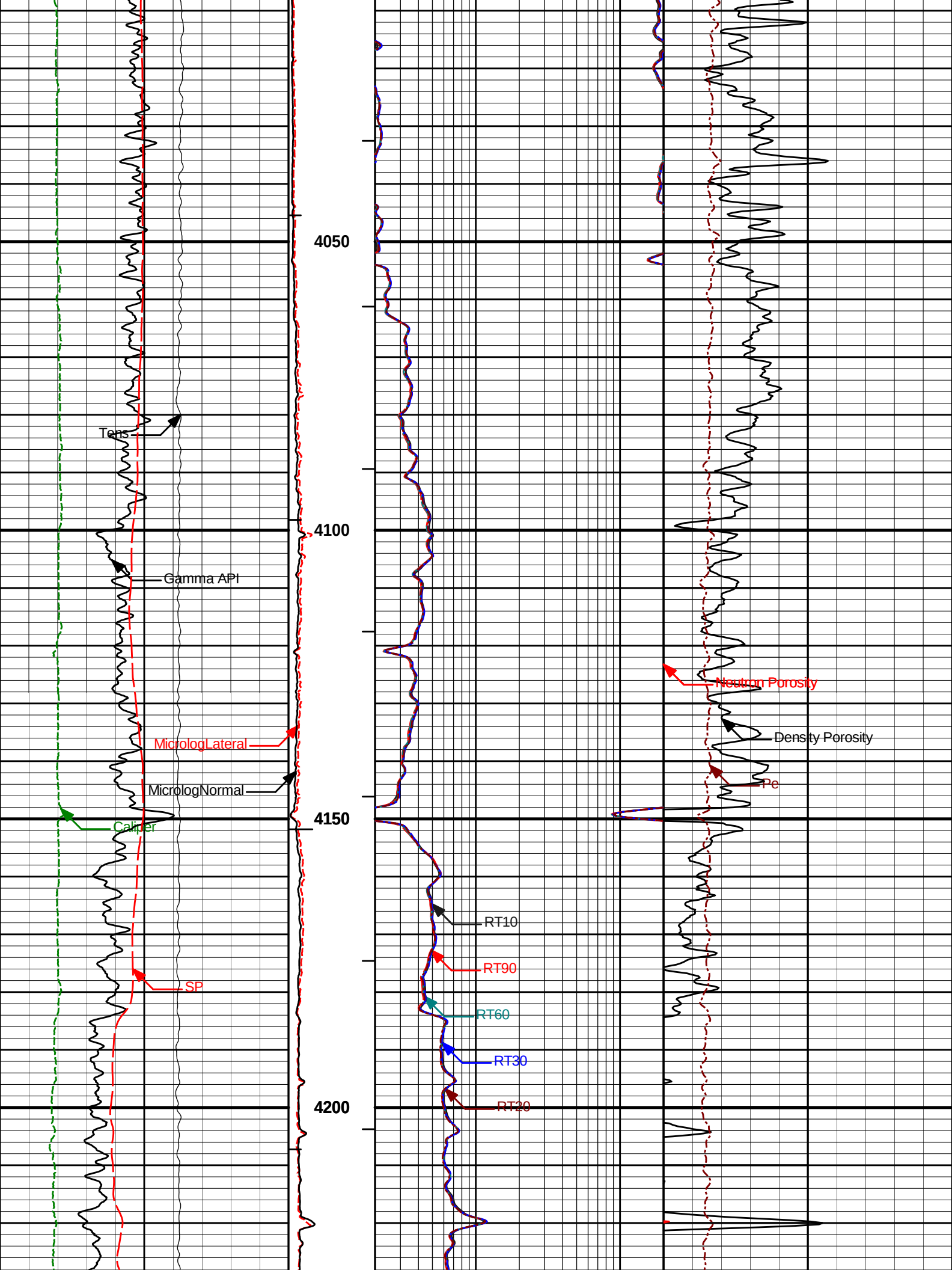
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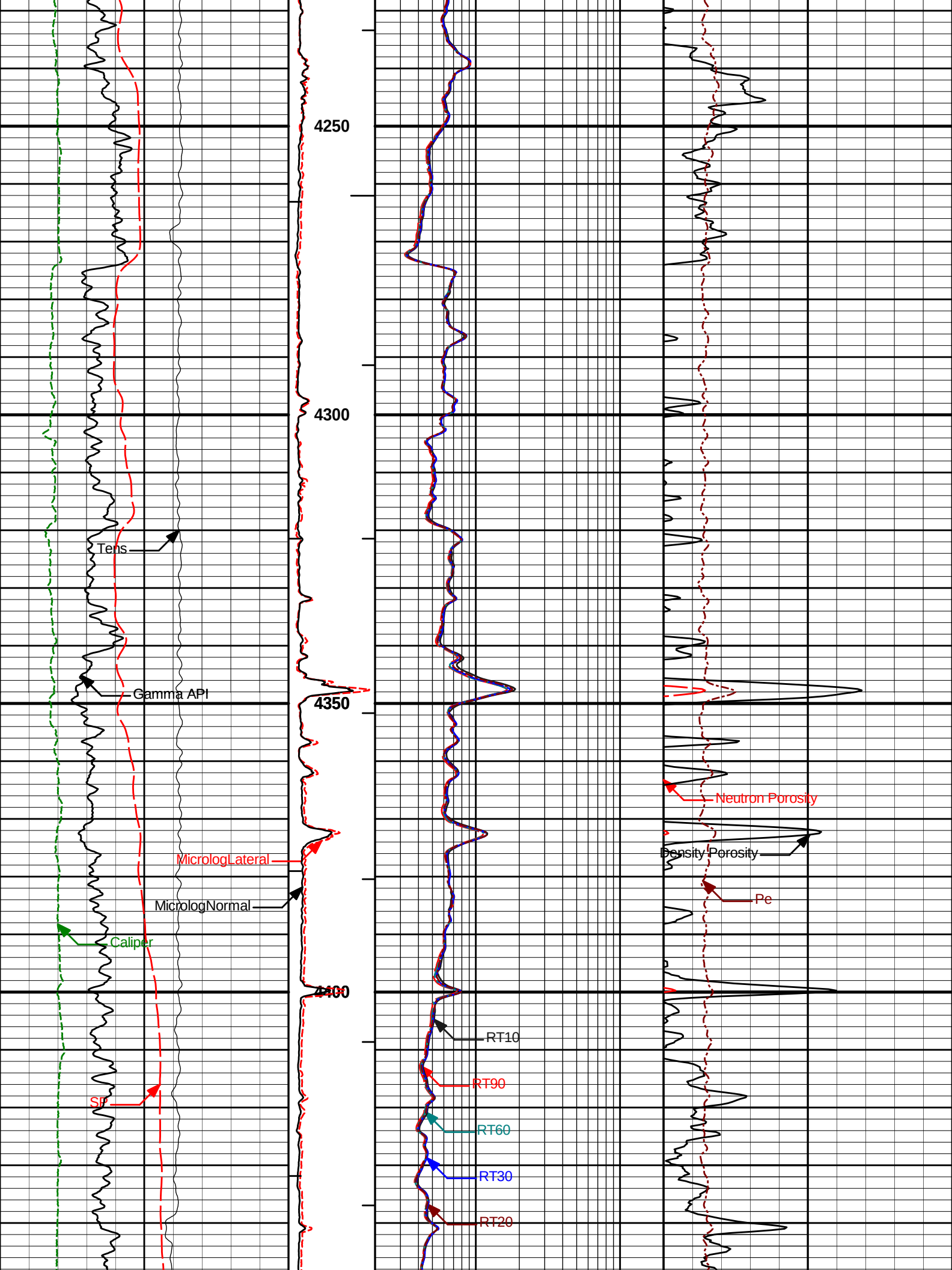
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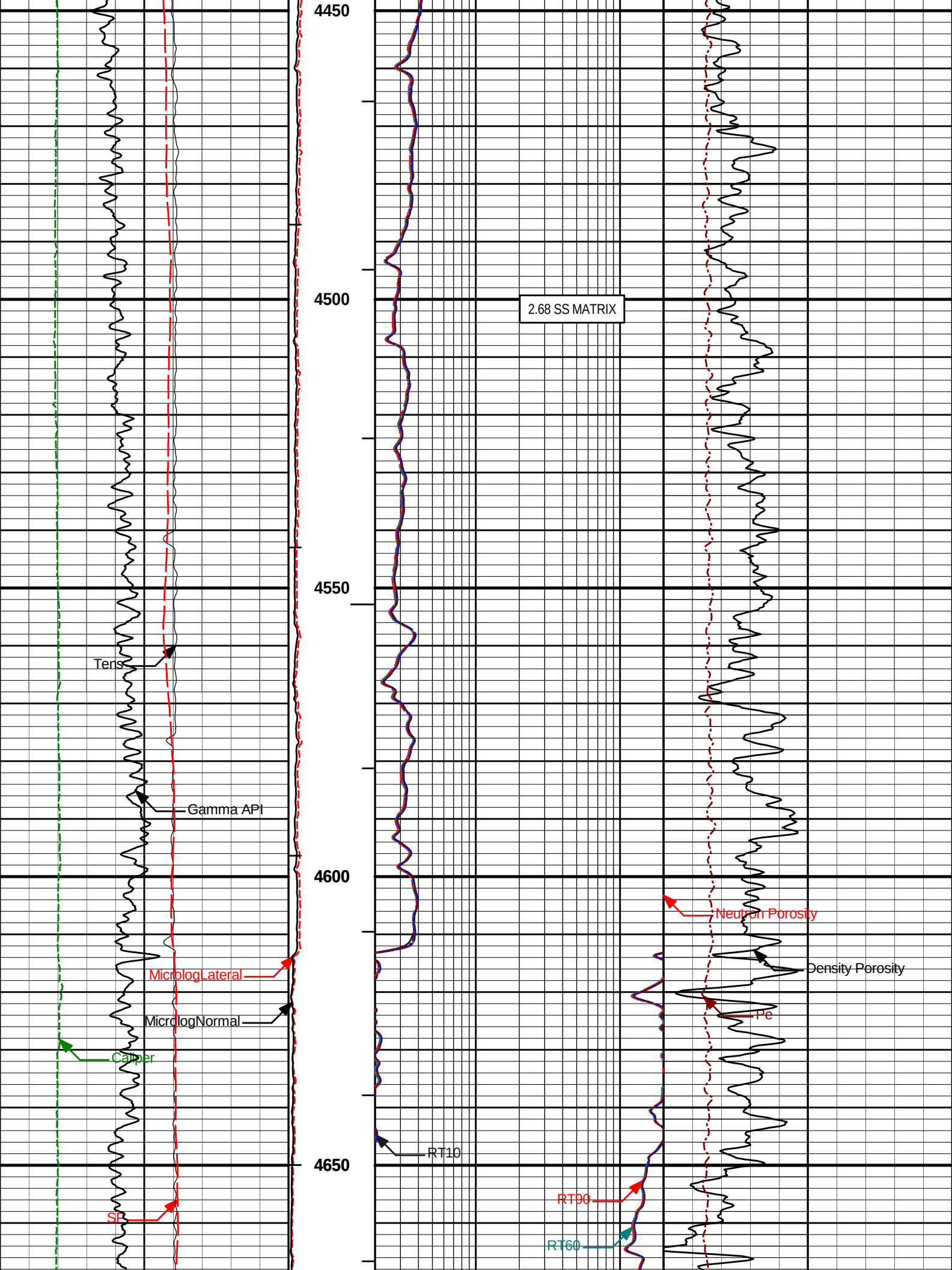
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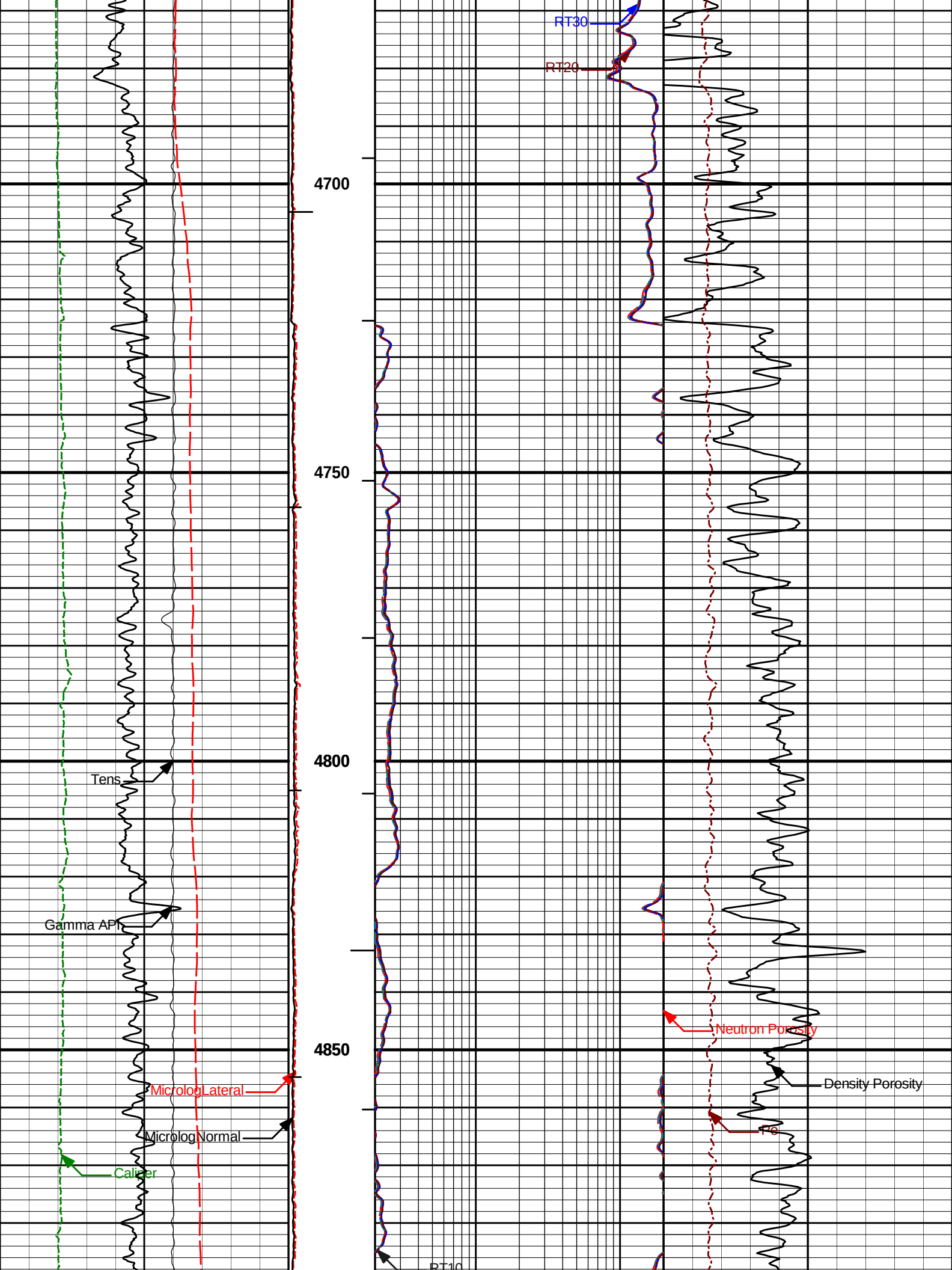
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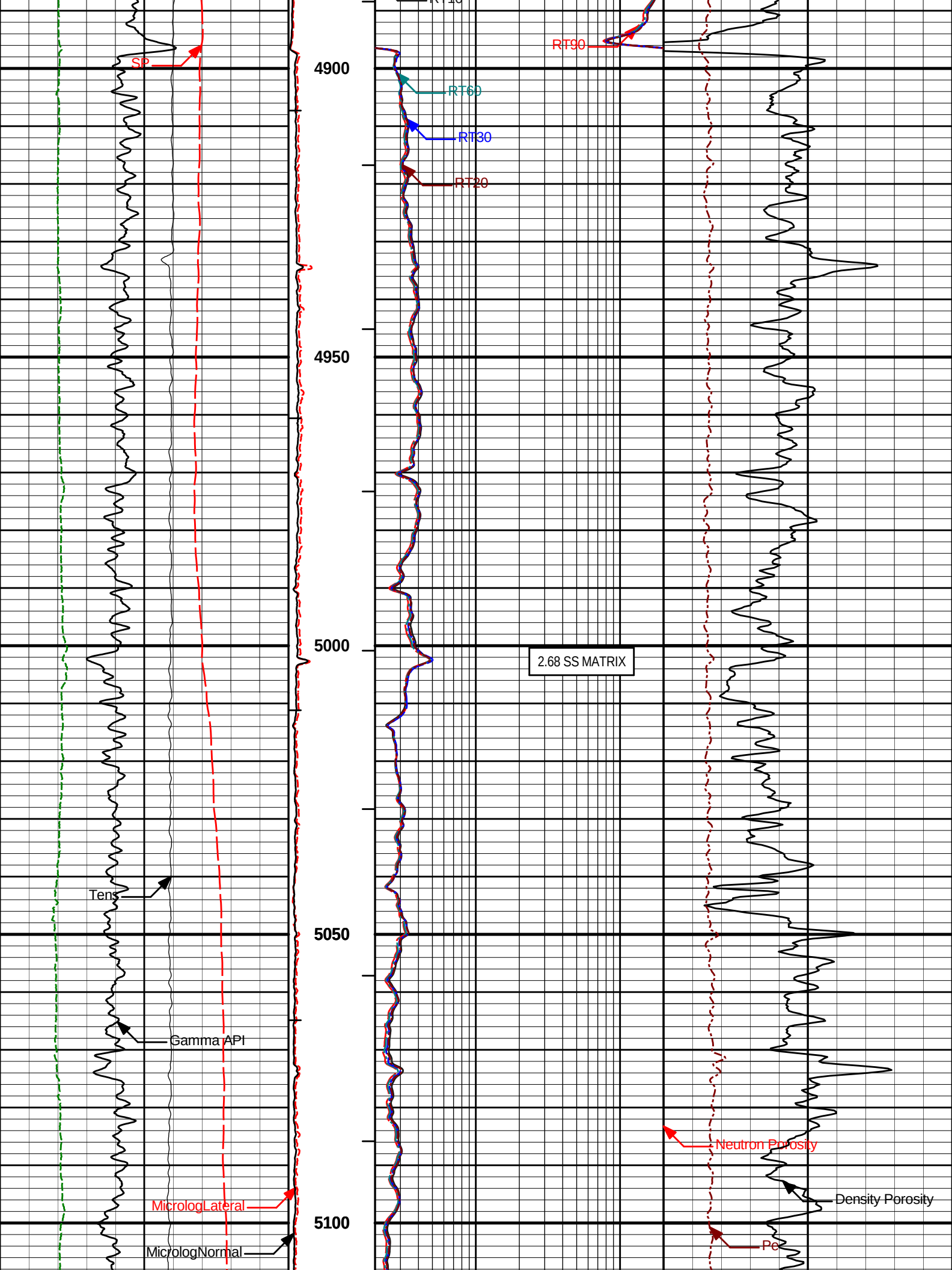
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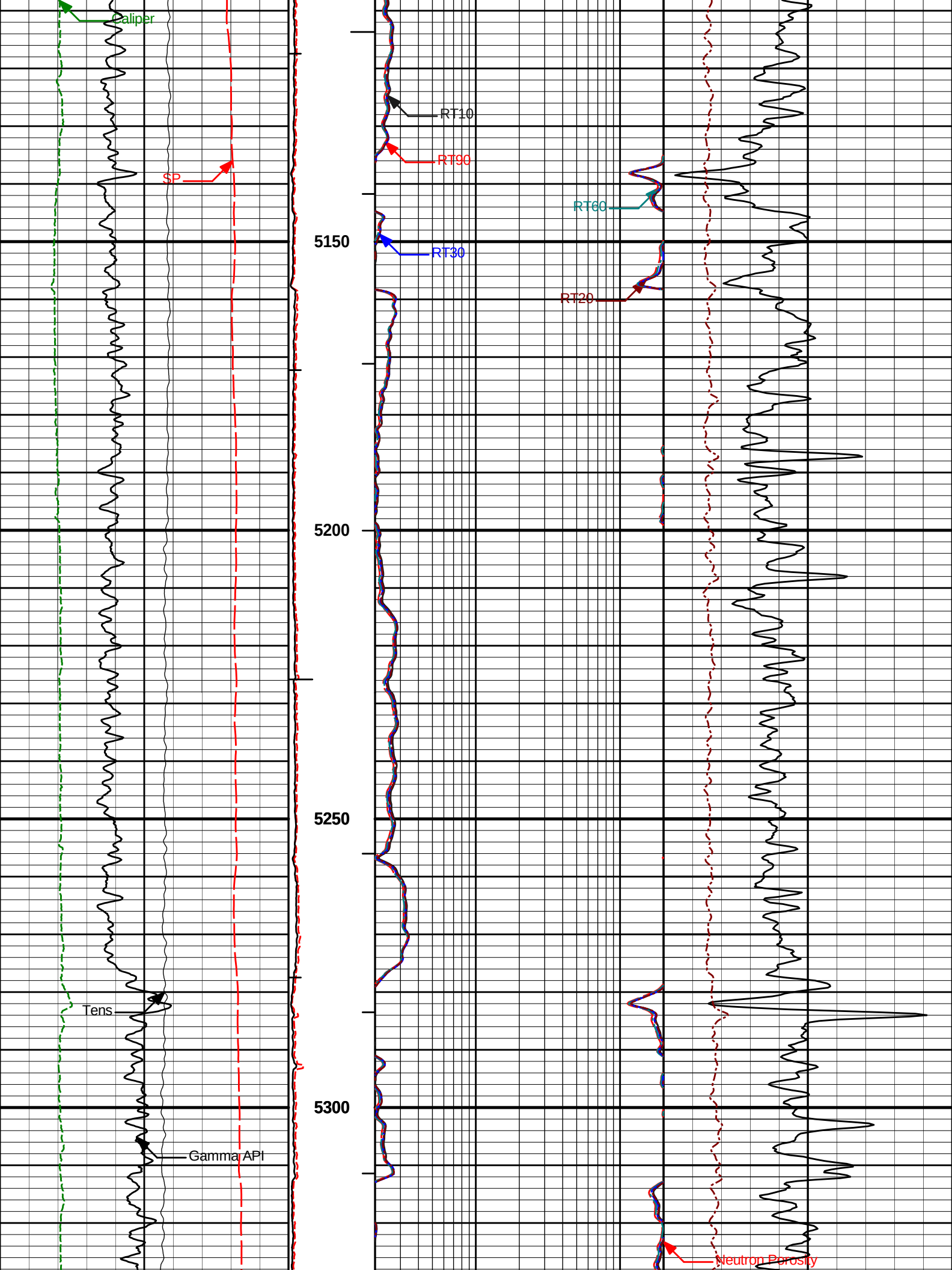
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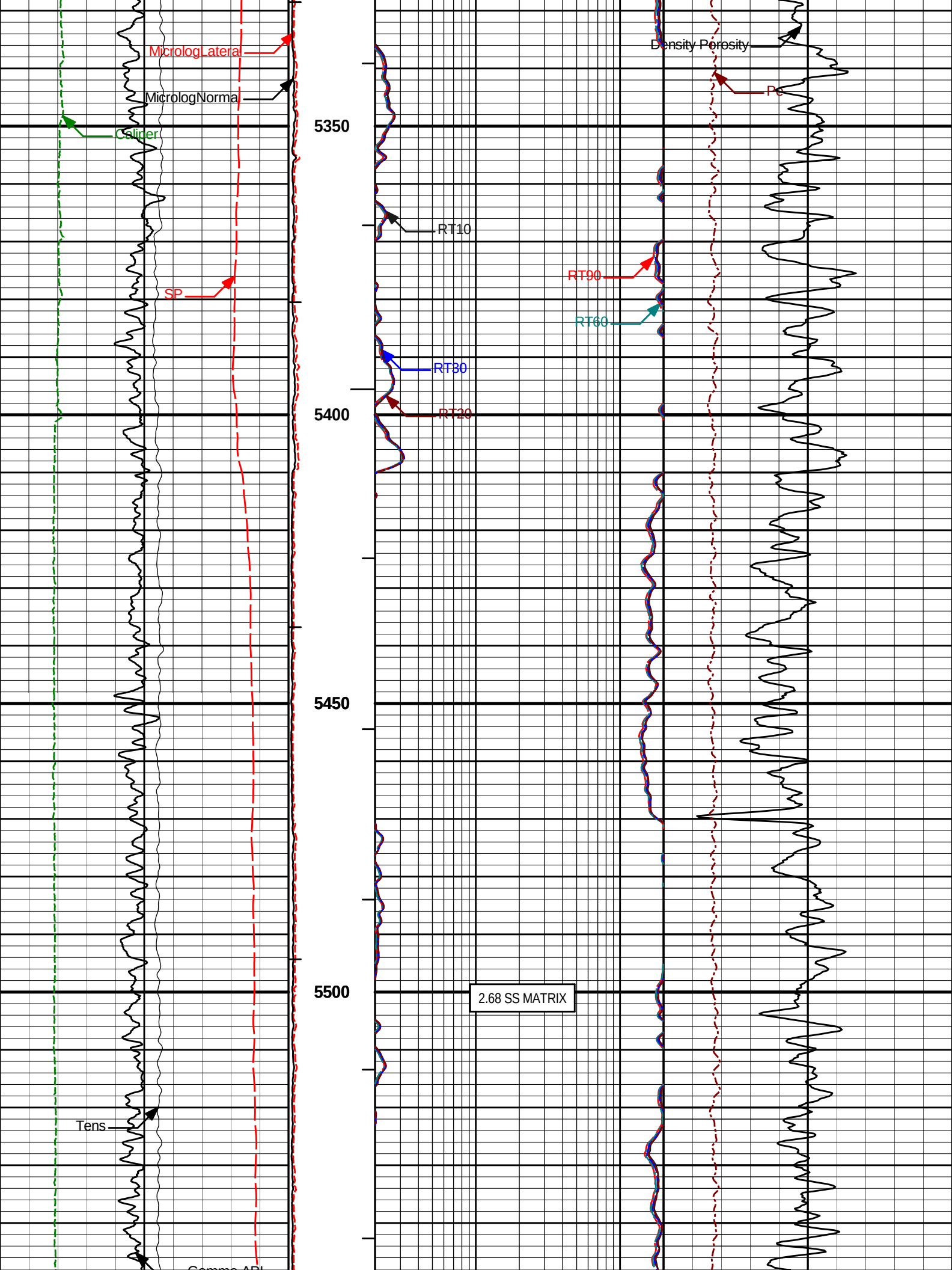
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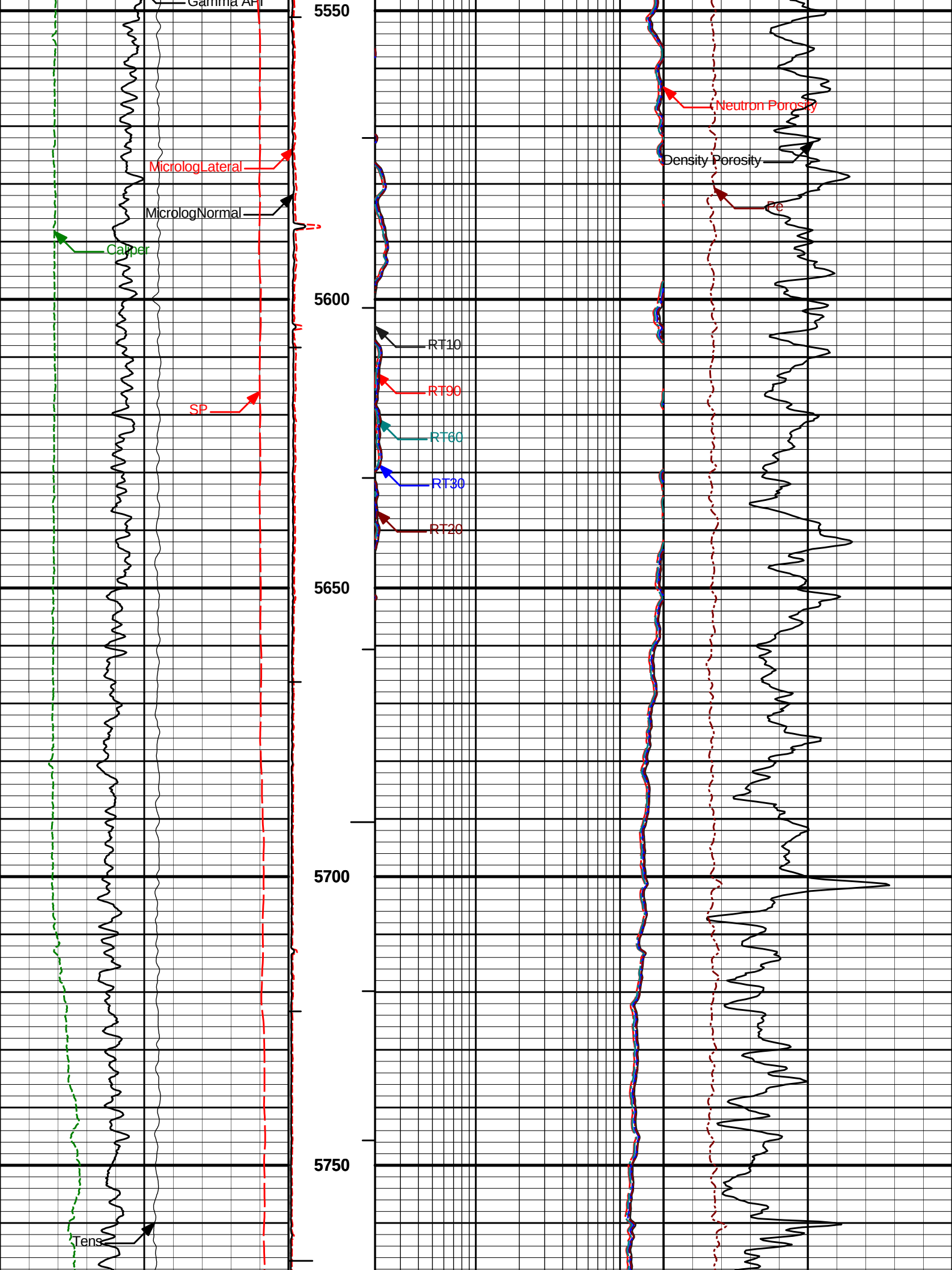
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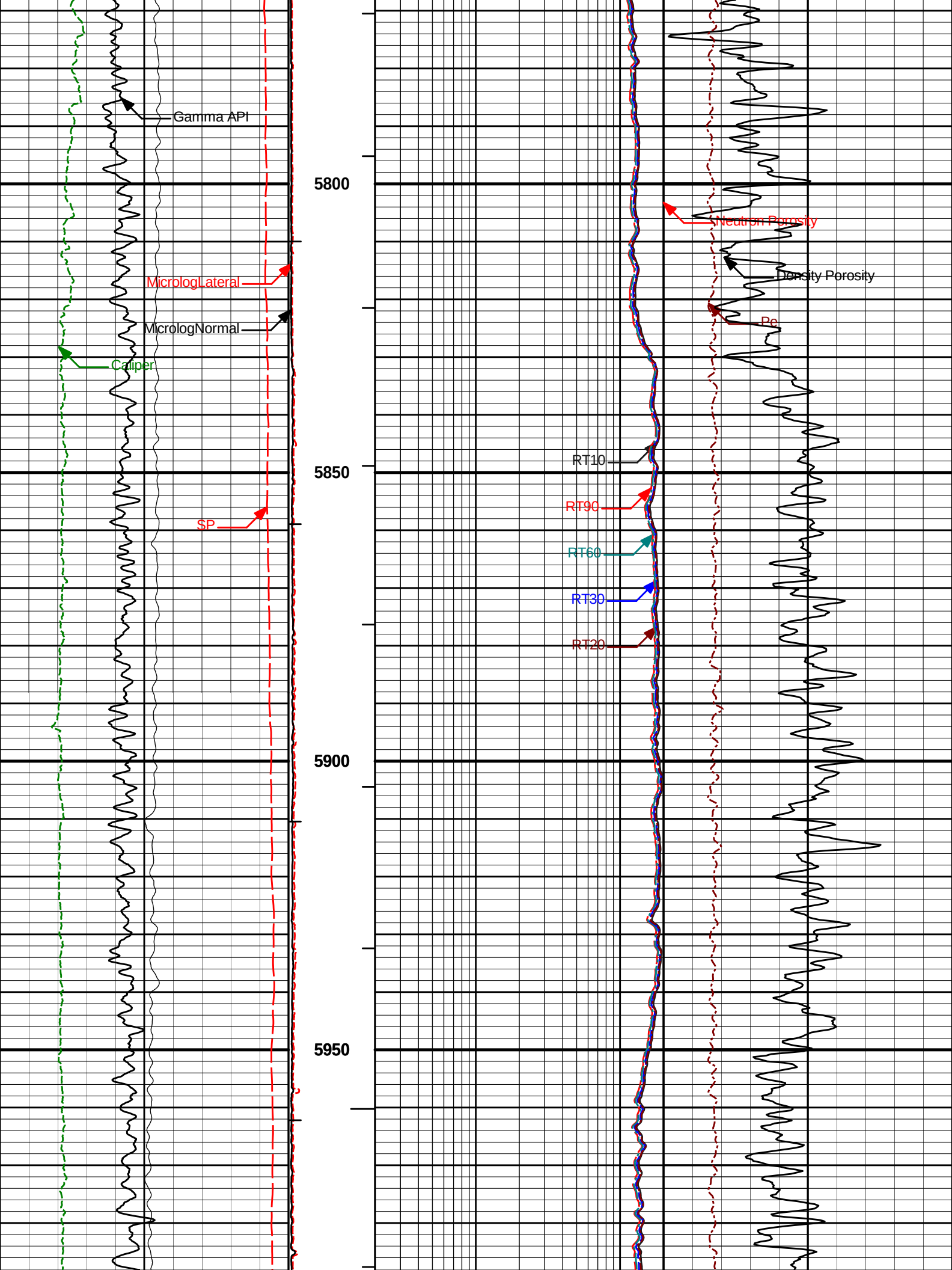
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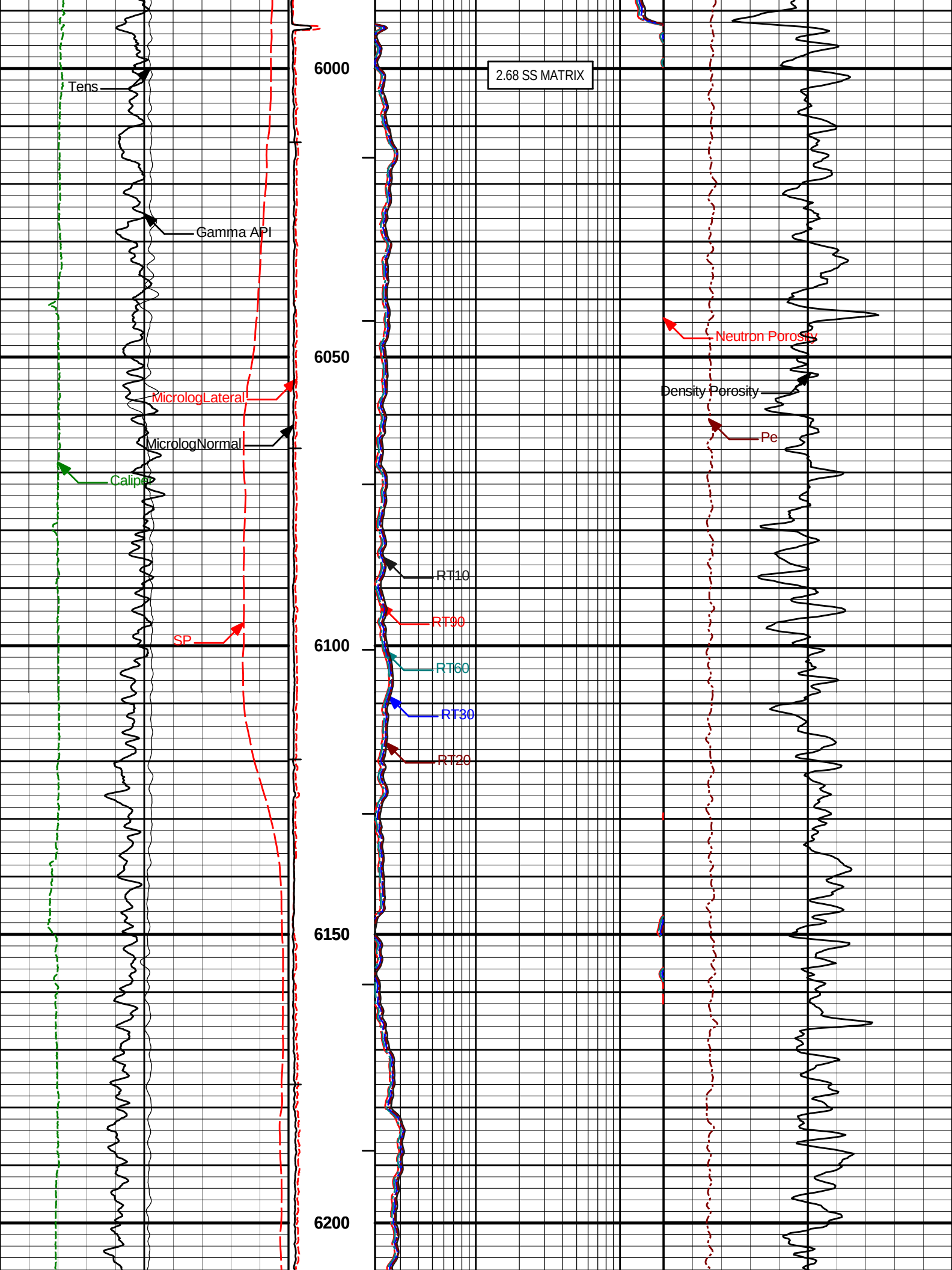
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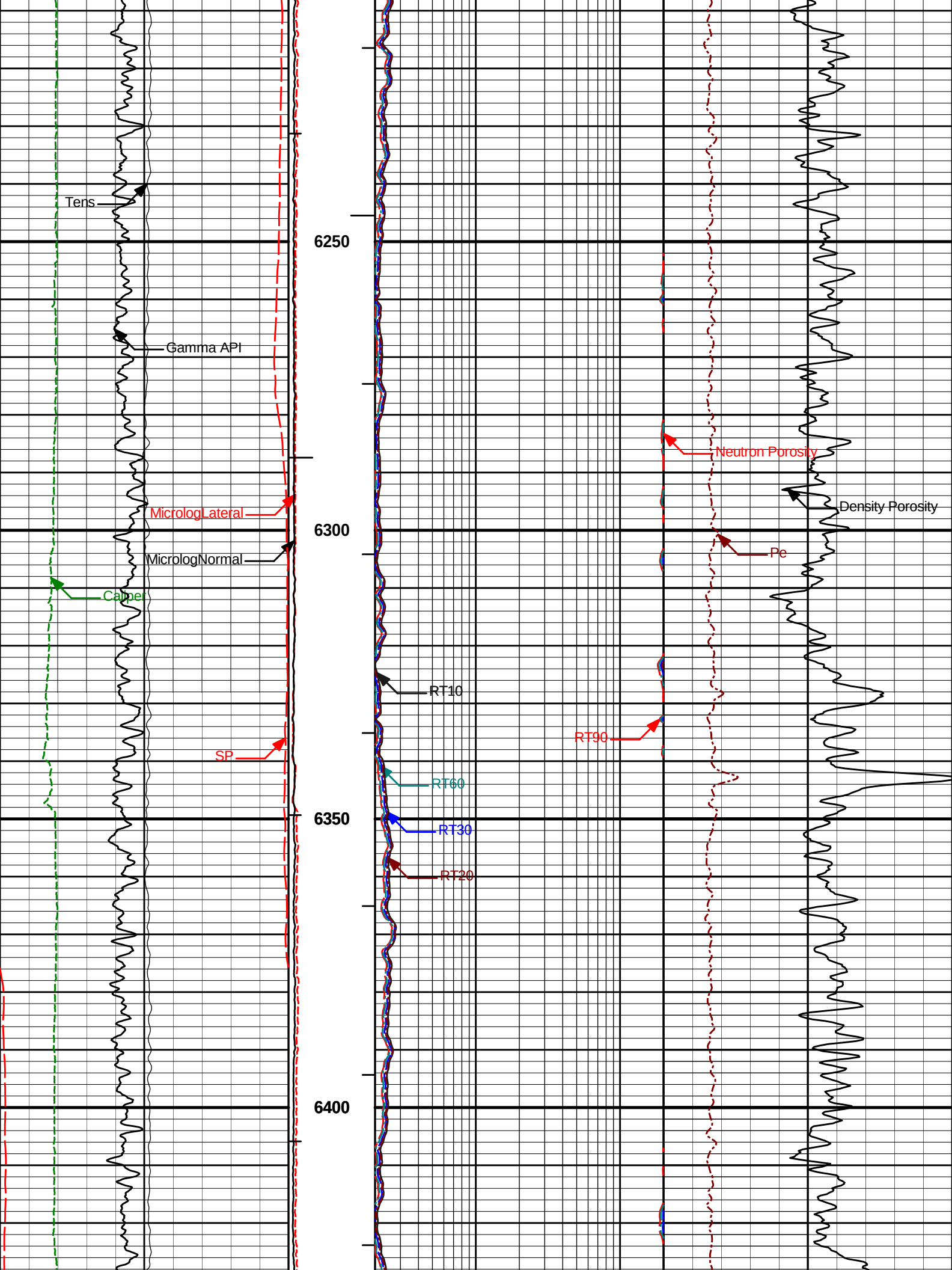
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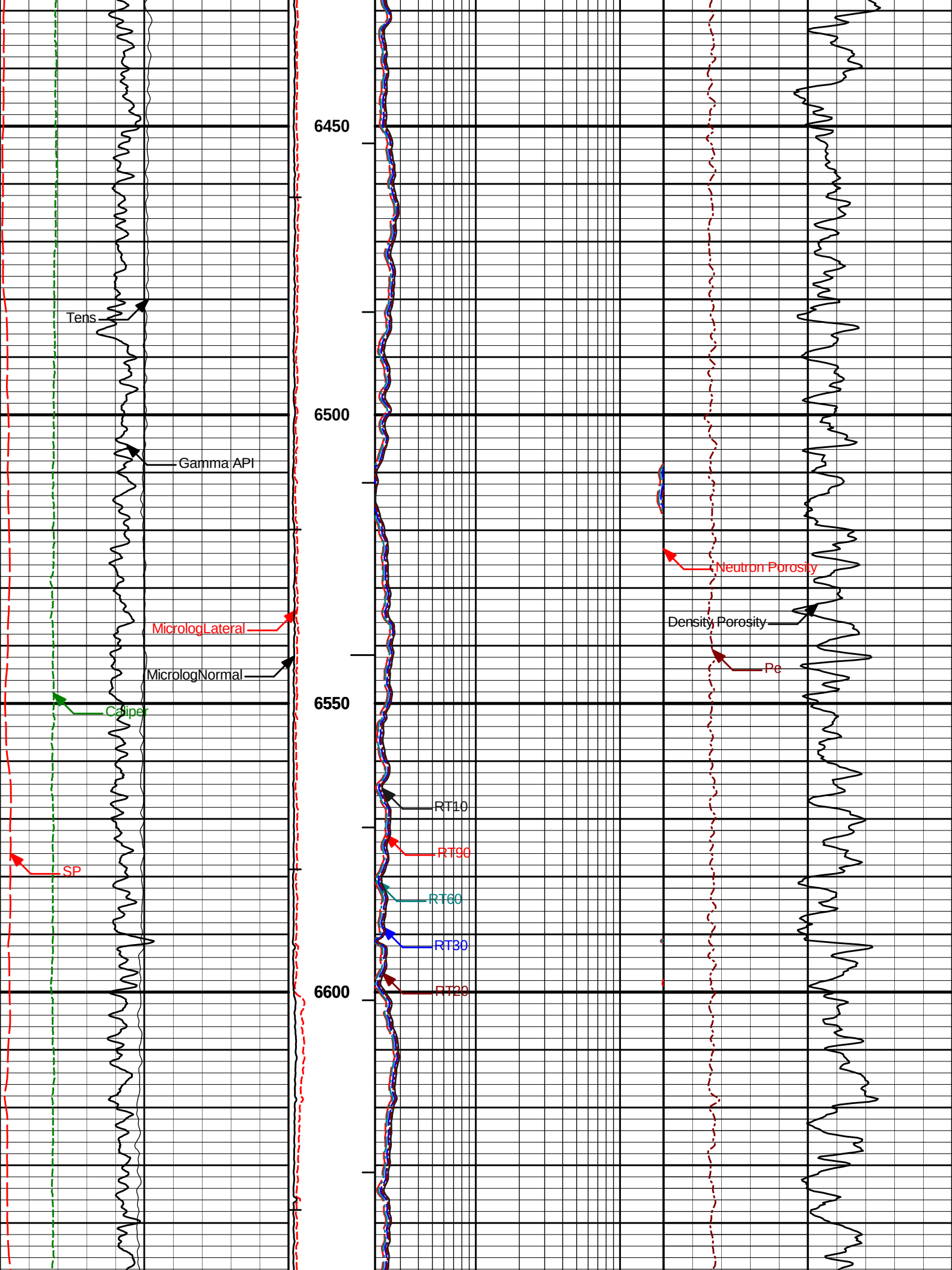
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Density Porosity
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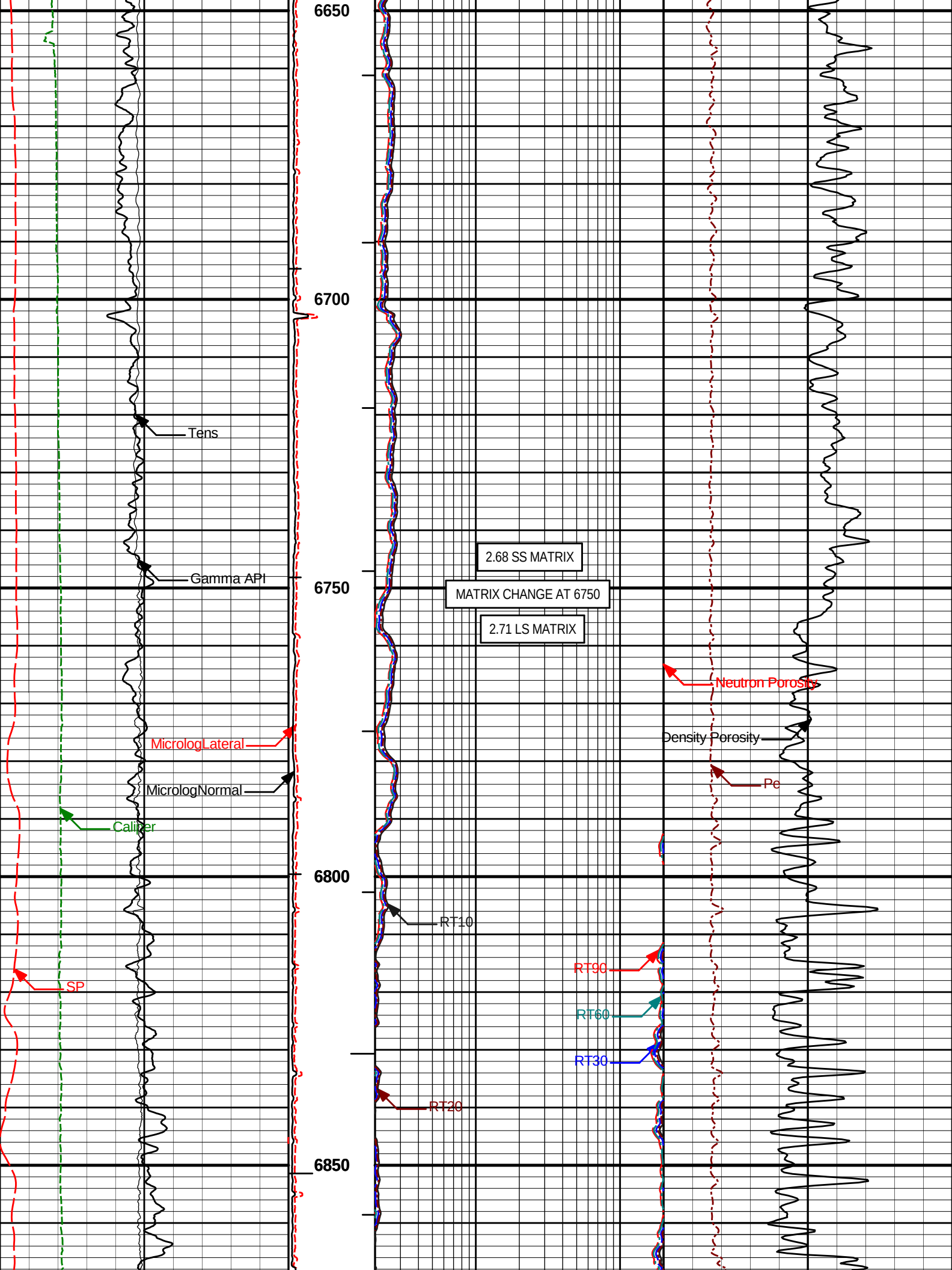
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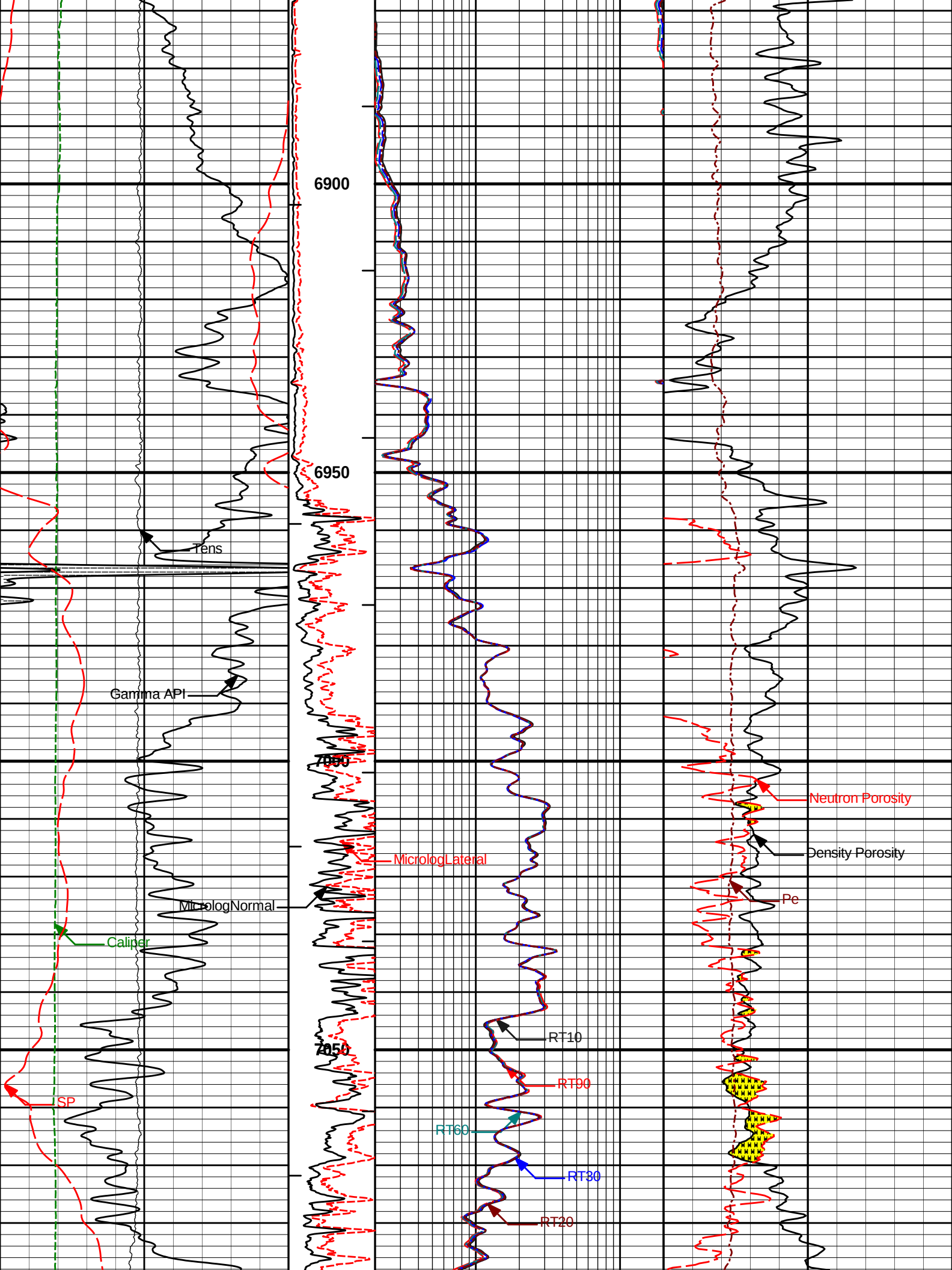
6750
6800
6850
Tens
Gamma API
MicrologLateral
MicrologNormal
Caliper
SP
2.68 SS MATRIX
MATRIX CHANGE AT 6750
2.71 LS MATRIX
Neutron Porosity
Density Porosity
Pe
RT10
RT90
RT60
RT30
RT20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Caliper
SP
RT10
RT90
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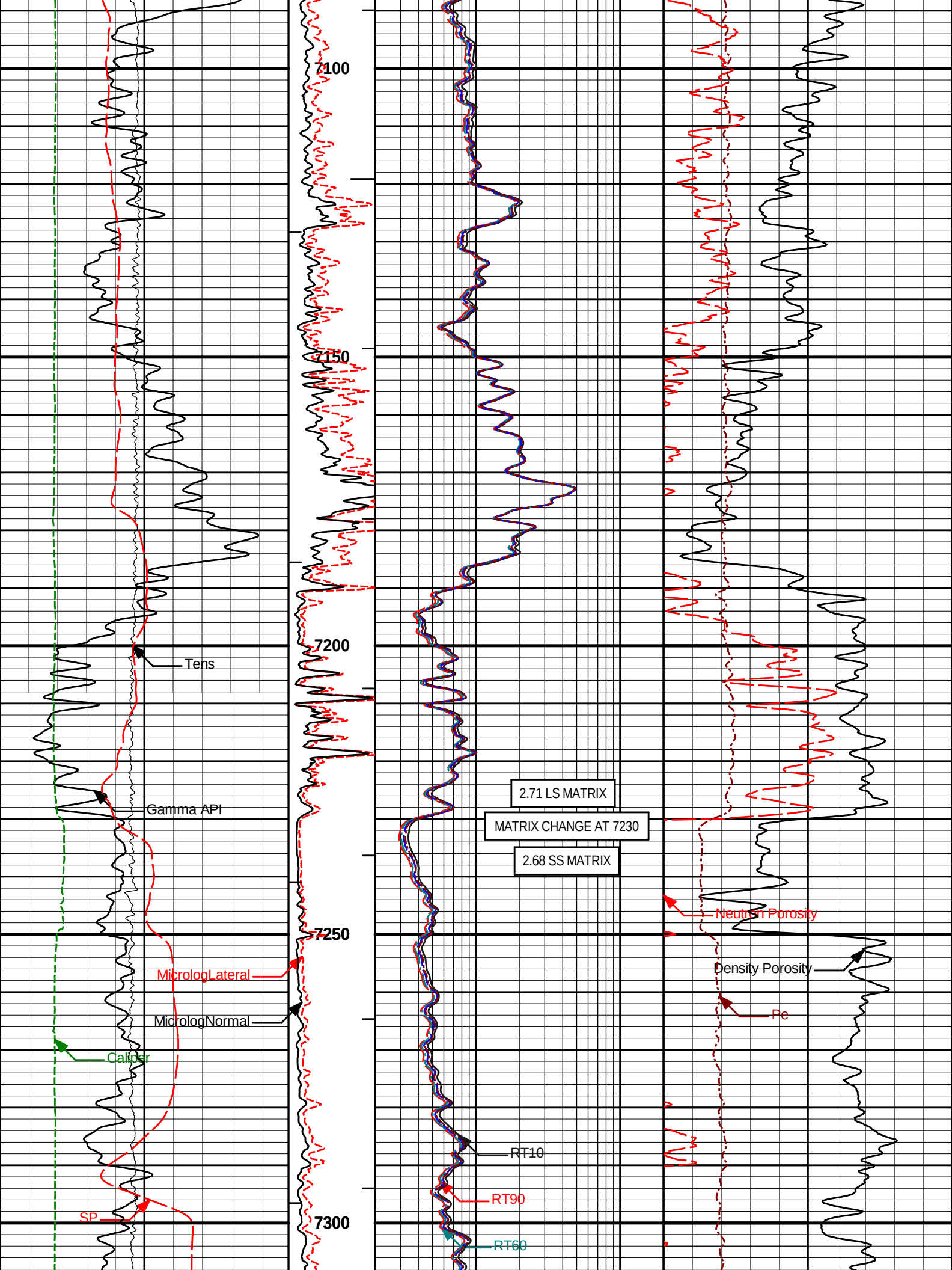
RT30
RT20
Neutron Porosity
Density Porosity
Pe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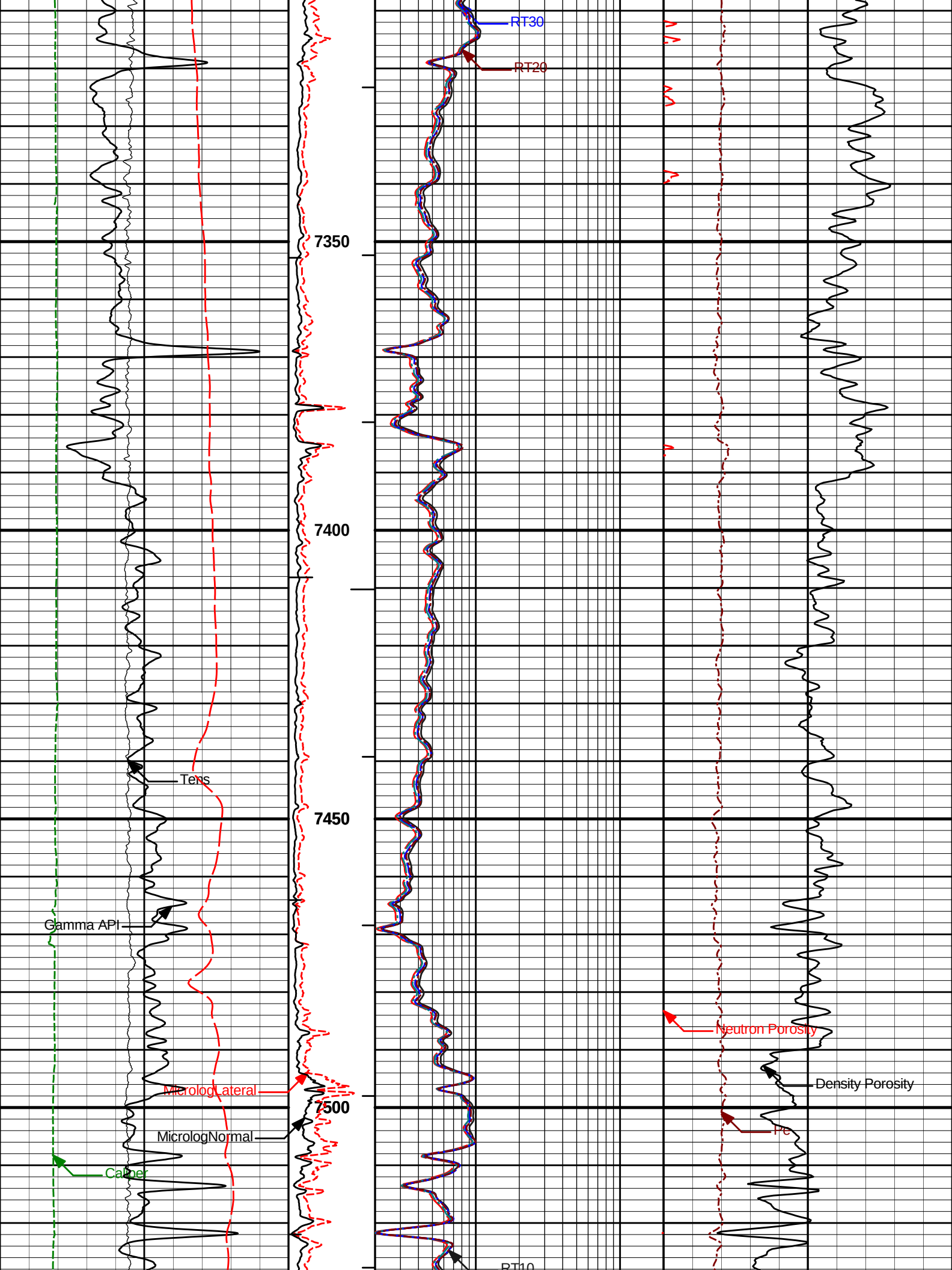
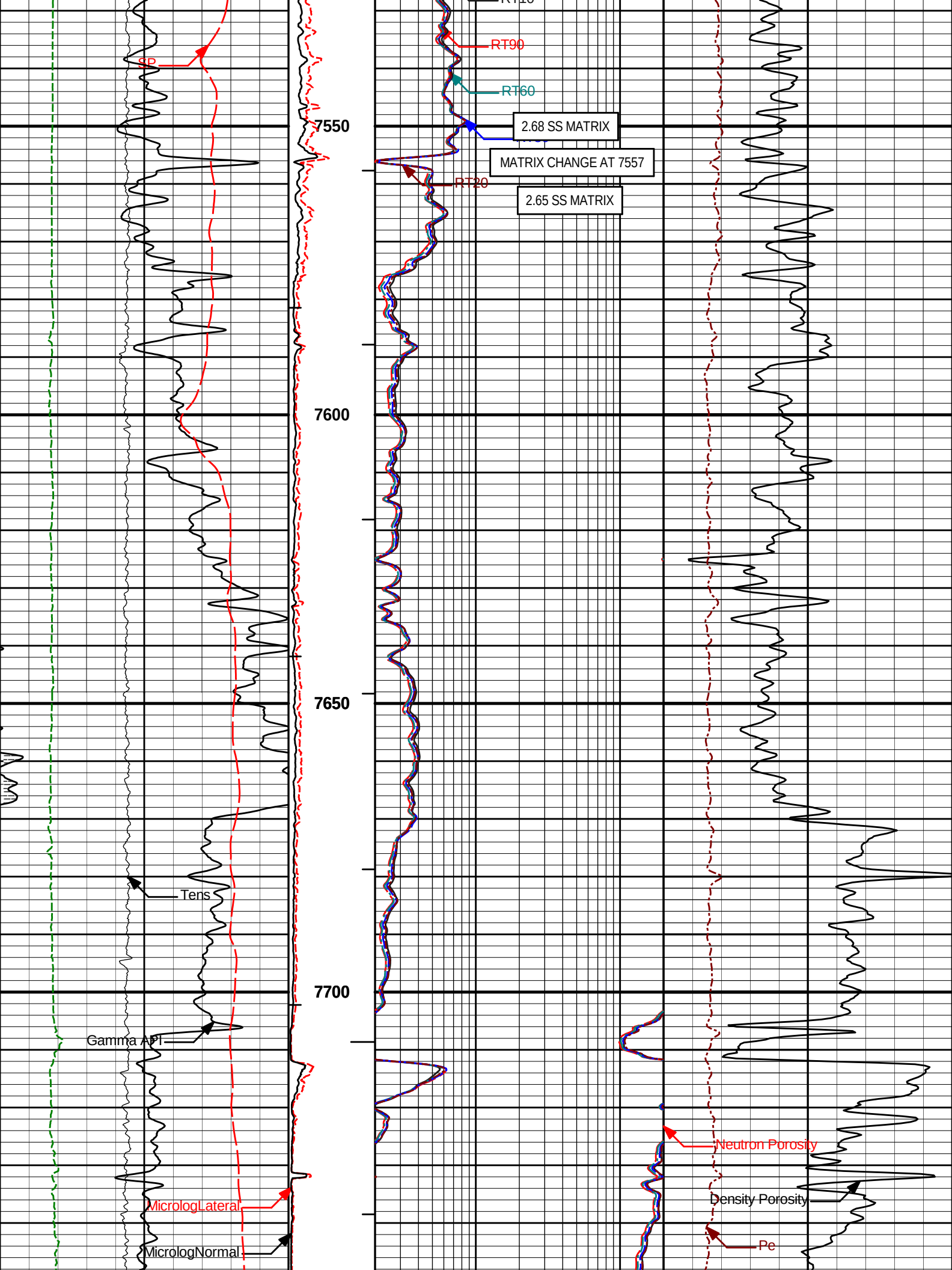
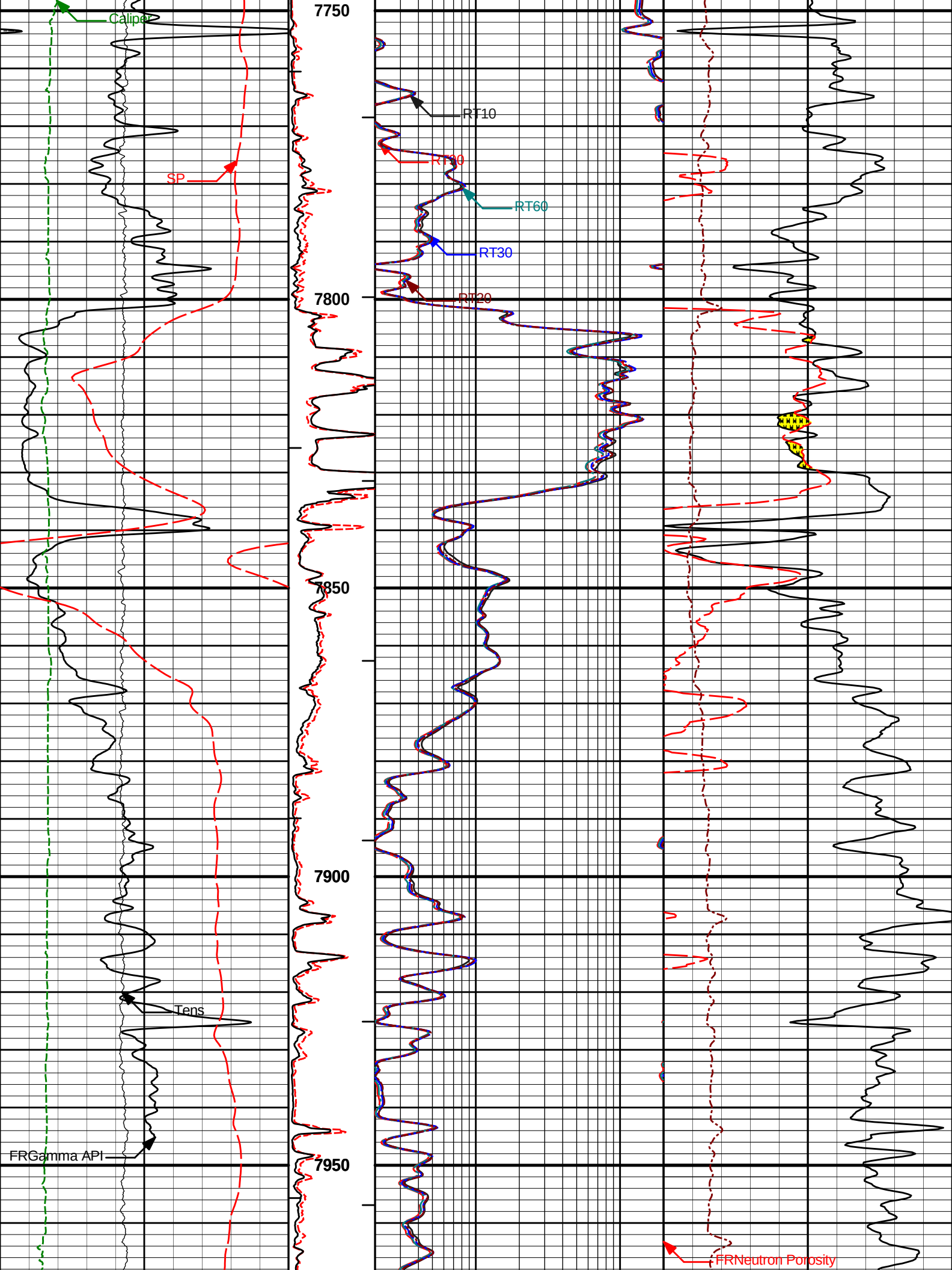
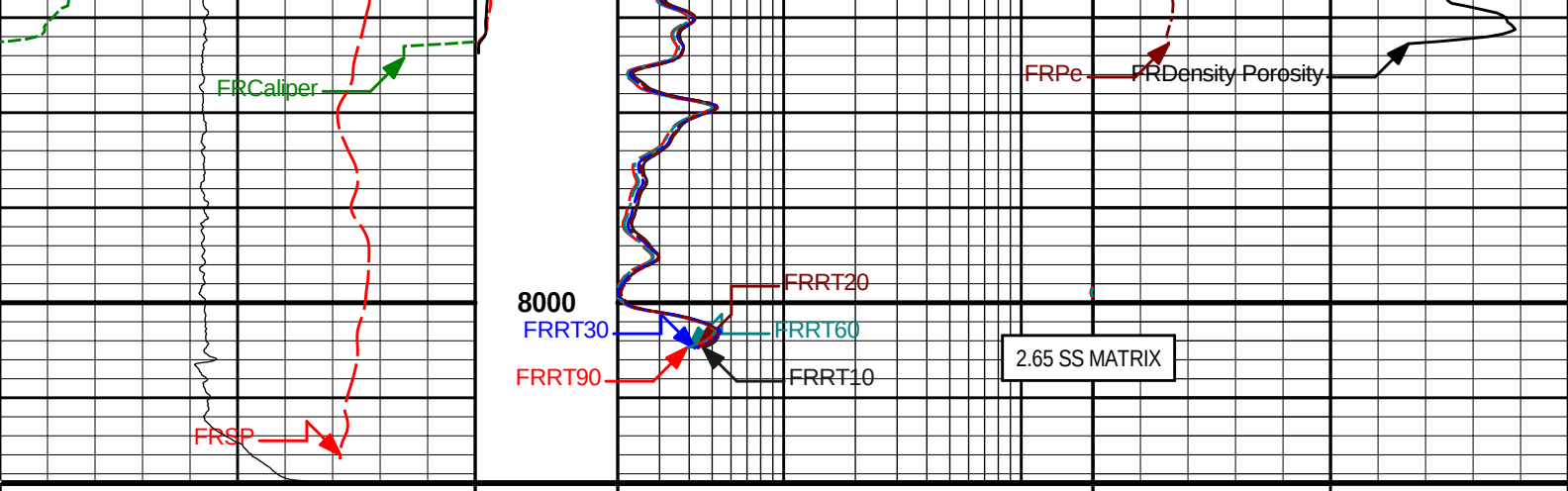
7150
7200
7250
7300
Tens
Gamma API
MicrologLateral
MicrologNormal
Caliper
SP
2.71 LS MATRIX
MATRIX CHANGE AT 7230
2.68 SS MATRIX
RT10
RT90
RT60
Neutron Porosity
Density Porosity
Pe


RT30
RT20
7350
7400
Tens
7450
Gamma API
Neutron Porosity
MicrologLateral
Density Porosity
7500
MicrologNormal
Pe
Caliper
RT10


SP
RT90
RT60
2.68 SS MATRIX
MATRIX CHANGE AT 7557
RT20
2.65 SS MATRIX
7550
7600
7650
7700
Tens
Gamma API
MicrologLateral
MicrologNormal
Neutron Porosity
Density Porosity
Pe


Caliper
SP
7750
RT10
RT90
RT60
RT30
RT20
7800
7850
7900
Tens
FRGamma API
7950
FRNeutron Porosity



50 **SP** 150 millivolts		1 : 240	2 **RT90** 200 Ohm-m	0 **Pe** 10	
0 **Gamma API** 250 api		**BHVT**	2 **RT60** 200 Ohm-m	20 **Density Porosity** 0 percent	
6 **Caliper** 16 inches		**AHVT**	2 **RT30** 200 Ohm-m	20 **Neutron Porosity** 0 percent	
10K Tens 0 pounds		MicrologLateral 0 30 ohm-metre	2 **RT20** 200 Ohm-m		
		MicrologNormal 0 30 ohm-metre	2 **RT10** 200 Ohm-m		

HALLIBURTON

Plot Time: 07-Aug-10 03:29:48
Plot Range: 1245 ft to 8018.83 ft
Data: STATE_PC_GC36\Well Based\MAIN*
Plot File: \\COMP\MAIN

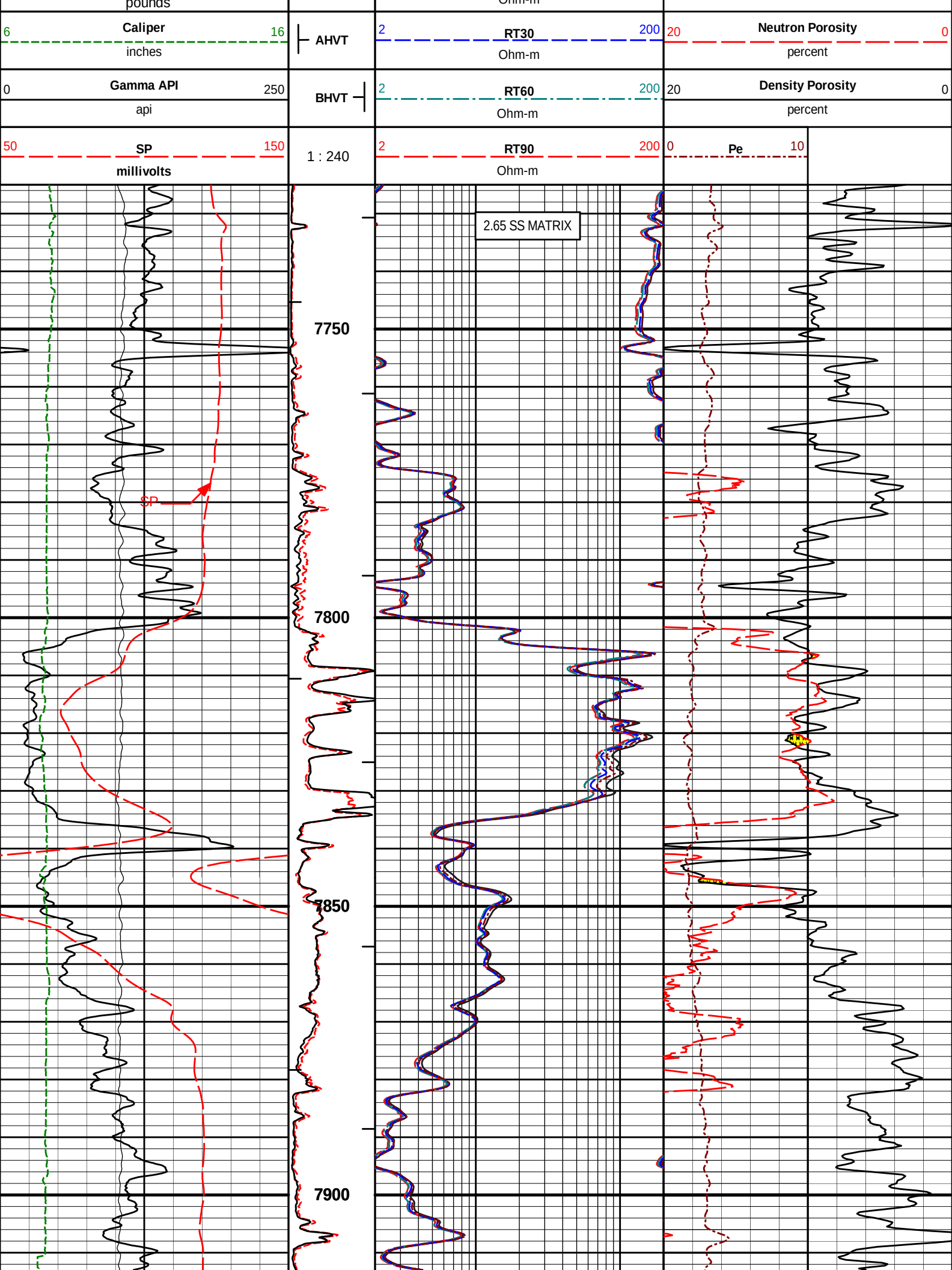
MAIN PASS 5" = 100'

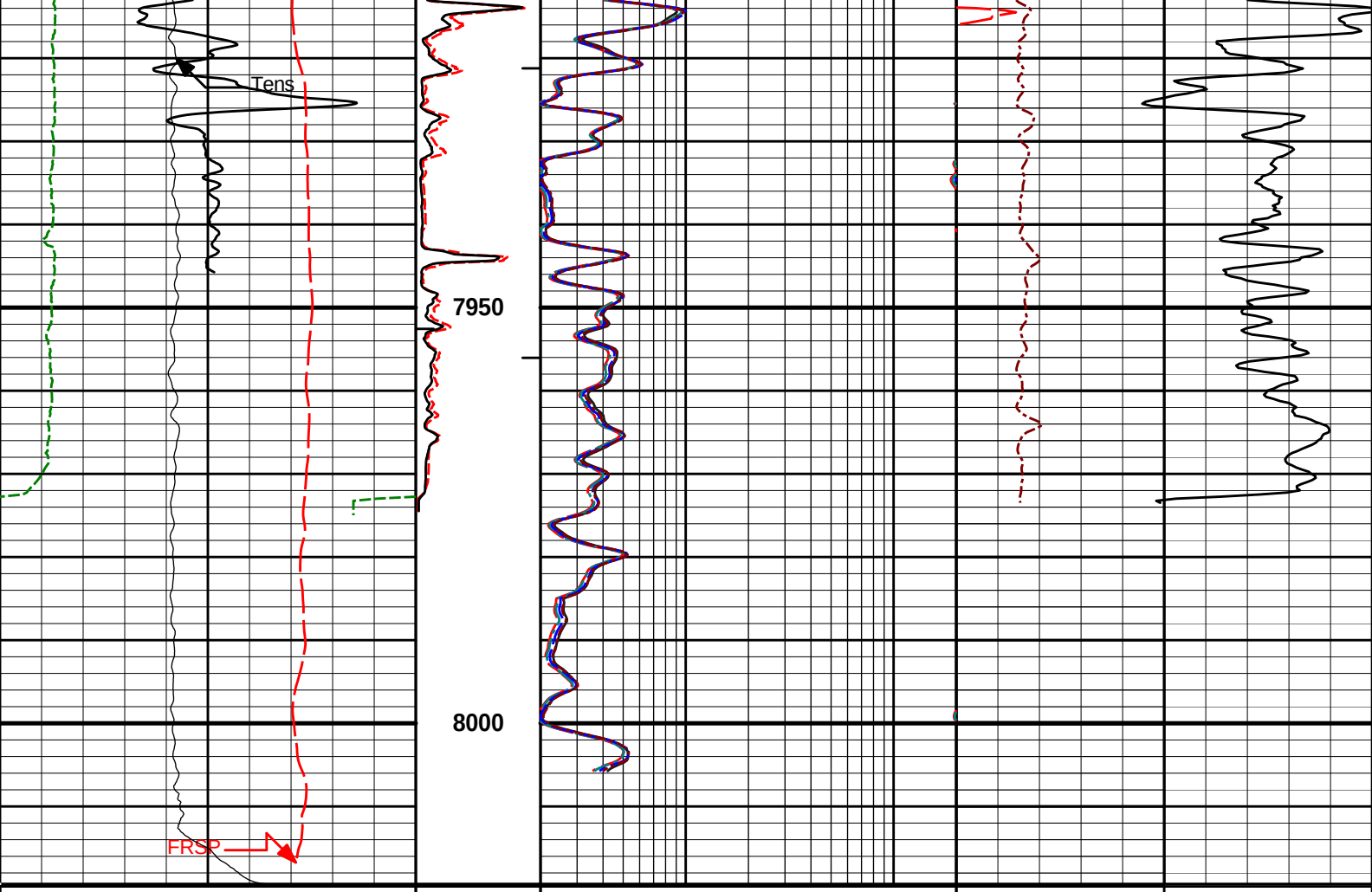
HALLIBURTON

Plot Time: 07-Aug-10 03:29:48
Plot Range: 7725 ft to 8019.33 ft
Data: STATE_PC_GC36\Well Based\REPEAT*
Plot File: \\COMP\REPEAT

REPEAT SECTION 5" = 100'

Track 1	Depth Track	Track 2	Track 5	Track 3
	MicrologNormal 0 30 ohm-metre	2 **RT10** 200 Ohm-m		
10K Tens 0 pounds	MicrologLateral 0 30 ohm-metre	2 **RT20** 200 Ohm-m		


pounds
6
Caliper
16
inches
AHVT
2
RT30
200
Ohm-m
20
Neutron Porosity
0
percent
0
Gamma API
250
api
BHVT
2
RT60
200
Ohm-m
20
Density Porosity
0
percent
50
SP
150
millivolts
1 : 240
2
RT90
200
Ohm-m
0
Pe
10
2.65 SS MATRIX
SP
7750
7800
7850
7900



50 **SP** 150 millivolts	1 : 240	2 **RT90** 200 Ohm-m	0 **Pe** 10	
0 **Gamma API** 250 api	**BHVT**	2 **RT60** 200 Ohm-m	20 **Density Porosity** 0 percent	
6 **Caliper** 16 inches	**AHVT**	2 **RT30** 200 Ohm-m	20 **Neutron Porosity** 0 percent	
10K Tens 0 pounds	MicrologLateral 0 30 ohm-metre	2 **RT20** 200 Ohm-m		
	MicrologNormal 0 30 ohm-metre	2 **RT10** 200 Ohm-m		

HALLIBURTON

Plot Time: 07-Aug-10 03:29:57
Plot Range: 7725 ft to 8019.33 ft
Data: STATE_PC_GC36\Well Based\REPEAT*
Plot File: \\COMP\REPEAT

REPEAT SECTION 5" = 100'

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:	**GTET - 11277436**	**Reference Calibration Date:**	**20-Jul-10 12:44:32**
Engineer:	**F. LODER**	**Calibration Date:**	**01-Aug-10 11:19:52**
Software Version:	**WL INSITE R3.0.4 (Build 6)**	**Calibration Version:**	**1**

Calibrator Source S/N: KW-290

Calibrator API Reference:230.00 api

Measurement	Measured	Calibrated	Units
Background	77.1	76.7	api
Background + Calibrator	312.5	310.7	api
Calibrator	233.6	234.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:	**GTET - 11277436**	**Reference Calibration Date:**	**01-Aug-10 11:19:52**
Engineer:	**C. BLUE**	**Calibration Date:**	**06-Aug-10 09:39:10**
Software Version:	**WL INSITE R3.0.4 (Build 6)**	**Calibration Version:**	**1**

Calibrator Source S/N: KW-290

Calibrator API Reference:230.00 api

Field Verification	Shop	Field	Units
Background	76.7	76.4	api
Background + Calibrator	310.7	307.4	api
Calibrator	234.0	231.0	api

Shop	Field	Difference	Tolerance
234.0	231.0	3.0	+/- 9.00

CSNG-FS SHOP CALIBRATION

Tool Name:	**CSNG - 10965402**	**Reference Calibration Date:**	**21-Jun-10 16:17:35**
Engineer:	**W. MATSON**	**Calibration Date:**	**20-Jul-10 12:11:34**
Software Version:	**WL INSITE R3.0.4 (Build 6)**	**Calibration Version:**	**1**
Source SN:	**KW-290**		

TITANIUM CASE	Measured	Calibrated	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	22.7	22.7	Channel #
583 KEV Peak Channel #	51.2	51.1	Channel #
2614 KEV Peak Channel #	210.3	209.6	Channel #
Calibrate Temperature	110.9	124.3	degF

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

Blanket Reference Value: 230.00 API

Calibrator Value: 261.2 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1635.1	CPS	328.8	321.8	API
Background	307.9	CPS	67.6	60.6	API

Gamma Ray Gain: 0.99

Gamma Gain Check: Passed

CSNG-FS FIELD CALIBRATION

Tool Name:	**CSNG - 10965402**	**Reference Calibration Date:**	**20-Jul-10 12:11:34**
Engineer:	**C. BLUE**	**Calibration Date:**	**06-Aug-10 09:45:23**
Software Version:	**WL INSITE R3.0.4 (Build 6)**	**Calibration Version:**	**1**
Source SN:			

TITANIUM CASE	Shop	Field	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	22.7	23.0	Channel #
583 KEV Peak Channel #	51.1	51.2	Channel #
2614 KEV Peak Channel #	209.6	210.8	Channel #
Calibrate Temperature	124.3	124.3	degF

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

Blanket Reference Value: 230.00 API

Calibrator Value: 261.2 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1636.1	CPS	321.8	326.0	API
Background	325.2	CPS	60.6	64.8	API

Gamma Ray Gain: 1.00

Gamma Gain Check: Passed

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	**DSNT - 11301132**	**Reference Calibration Date:**	**22-Jun-10 16:34:25**
Engineer:	**C. BLUE**	**Calibration Date:**	**22-Jun-10 16:50:38**
Software Version:	**WL INSITE R3.0.4 (Build 6)**	**Calibration Version:**	**1**

Logging Source S/N: DSN-434

Tank Serial Number: BRIGHTONWATERTANK

Reference value assigned to Tank: 55.000

Snow Block S/N: BRIGHTON

Calibration Tank Water Temperature: 70 degF

Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS			
Measurement	**Prev. Value**	**New Value**	**Control Limit On New Value**
Gain:	1.013	1.018	0.900 - 1.100

WATER TANK SUMMARY (Horizontal Water Tank)				
Measurement	**Current Reading (Previous Coef.)**	**Calibrated (New Coef.)**	**Change**	**Control Limit On Change**
Porosity (decp):	0.2283	0.2296	0.0012	+/- 0.0020
Calibrated Ratio:	10.31	10.35	0.041	+/- 0.050

VERIFIER

Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0866	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-Jun-10 16:50:38

Engineer: C. BLUE **Calibration Date:** 06-Aug-10 14:00:32

Software Version: WL INSITE R3.0.4 (Build 6) **Calibration Version:** 1

Logging Source S/N: DSN-434

Snow Block S/N: BRIGHTON

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0866	0.0812	-0.0054	+/- 0.0150

PASS/FAIL SUMMARY	
Block Change Check:	Passed
Snow Block Stat Check:	Passed
Temperature Check:	Passed

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name: SDLT - I132M275 **Reference Calibration Date:** 21-Jun-10 13:03:40

Engineer: F. LODER **Calibration Date:** 20-Jul-10 15:11:00

Software Version: WL INSITE R3.0.4 (Build 6) **Calibration Version:** 1

Logging Source S/N: 2770GW

Aluminum Block S/N: BRIGHTON_AL Density: 2.600g/cc Pe: 3.100

Magnesium Block S/N: BRIGHTON_MG Density: 1.680g/cc Pe: 2.594

DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0646	1.0642	0.90 - 1.10
Near Dens Gain	1.0263	1.0244	0.90 - 1.10
Near Peak Gain	1.0385	1.0404	0.90 - 1.10
Near Lith Gain	1.0161	1.0149	0.90 - 1.10
Far Bar Gain	1.0229	1.0194	0.90 - 1.10
Far Dens Gain	1.0076	1.0054	0.90 - 1.10
Far Peak Gain	1.0002	0.9965	0.90 - 1.10
Far Lith Gain	0.9722	0.9661	0.90 - 1.10
Near Bar Offset	-0.3448	-0.3458	NONE
Near Dens Offset	-0.0119	0.0006	NONE
Near Peak Offset	-0.1195	-0.1399	NONE
Near Lith Offset	0.0440	0.0515	NONE
Far Bar Offset	-0.0002	0.0262	NONE
Far Dens Offset	0.1163	0.1296	NONE
Far Peak Offset	0.1507	0.1721	NONE
Far Lith Offset	0.2987	0.3386	NONE
Near Bar Background	956.86	956.41	700 - 1450

Near Dens Background	316.67	316.89	230 - 480
Near Peak Background	136.92	137.59	100 - 210
Near Lith Background	166.23	167.00	125 - 260
Far Bar Background	502.62	505.28	450 - 900
Far Dens Background	201.83	199.86	175 - 345
Far Peak Background	78.15	78.21	70 - 140
Far Lith Background	81.94	81.91	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.678	1.680	0.002	+/- 0.015
Pe	2.589	2.593	0.004	+/- 0.150
ALUMINUM				
Density (g/cc)	2.600	2.600	-0.000	+/- 0.01500
Pe	3.102	3.099	-0.003	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0017	+/- 0.0110	-0.0024	+/- 0.0140
Magnesium Block	0.0001	+/- 0.0110	-0.0014	+/- 0.0140
Aluminum Block	-0.0009	+/- 0.0110	-0.0005	+/- 0.0140
Resolution	8.78	6.00 - 11.50	9.76	6.00 - 11.50
Internal Verifier(B+D+P+L)	1578	1200 - 2700	865	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
Gains Check:	Passed
Changes in Calibration Blocks:	Passed

SPECTRAL DENSITY FIELD CHECK

Tool Name: SDLT - I132M275 **Reference Calibration Date:** 20-Jul-10 15:11:00

Engineer: C. BLUE **Calibration Date:** 06-Aug-10 09:32:04

Software Version: WL INSITE R3.0.4 (Build 6) **Calibration Version:** 1

Pad Temperature: 75.2 degF

DENSITY FIELD CALIBRATION SUMMARY

Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1577.897	1574.409	-3.488	15.980
Far (B+D+P+L) cps	865.263	869.785	4.522	16.093
Near Resolution	8.78	8.83	0.050	0.50
Far Resolution	9.76	9.85	0.090	1.00

PASS/FAIL SUMMARY

Bkg Quality Check:	Passed
Bkg Resolution Check:	Passed
Bkg Verification Check:	Passed

MICRO LOG SHOP CALIBRATION

Tool Name: SDLT - I132M275 **Reference Calibration Date:** 19-Jul-10 17:23:27

Engineer: C. BLUE **Calibration Date:** 06-Aug-10 13:52:00

Software Version: WL INSITE R3.0.4 (Build 6) **Calibration Version:** 1

CALIBRATION COEFFICIENT SUMMARY

Measurement	Micro Log Normal		Micro Log Lateral		
	Measured	Calibrated	Measured	Calibrated	Units
Tool Zero	-0.14	-0.11	0.00	0.00	ohmm
Calibration Point #1	-0.03	0.00	0.00	0.00	ohmm
Calibration Point #2	19.96	20.00	19.98	20.00	ohmm
Internal Reference	19.89	19.93	19.97	19.99	ohmm

Measurement	Micro Log Normal Tool Value	Micro Log Lateral Tool Value	Units
Tool Zero	-5.41	-0.13	V
Calibration Point #1	23.64	-1.02	V
Calibration Point #2	5208.00	6801.49	V
Internal Reference	5188.80	6799.48	V

MICRO LOG FIELD CHECK

Tool Name: SDLT - I132M275 **Reference Calibration Date:** 06-Aug-10 13:52:00

Engineer: C. BLUE **Calibration Date:** 06-Aug-10 13:52:31

Software Version: WL INSITE R3.0.4 (Build 6) **Calibration Version:** 1

Measurement	Micro Log Normal		Micro Log Lateral		
	Shop	Field	Shop	Field	Units
Tool Zero	-0.11	-0.11	0.00	-0.00	ohmm
Internal Reference	19.93	19.93	19.99	20.00	ohmm

Summary

Signal	Shop	Field	Difference	Tolerence
Microlog Normal	19.93	19.93	0.00	+/- 0.80
Microlog Lateral	19.99	20.00	-0.01	+/- 0.80

DENSITY CALIPER SHOP CALIBRATION

Tool Name: SDLT - I132M275 **Reference Calibration Date:** 28-Jul-10 22:05:38

Engineer: C. BLUE **Calibration Date:** 28-Jul-10 22:10:07

Software Version: WL INSITE R3.0.4 (Build 6) **Calibration Version:** 1

CALIBRATION COEFFICIENTS

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-2229.74	-2333.87	-7000.00 - -1000.00
Pad Gain	0.0003920	0.0003958	0.000200 - 0.000600
Arm Offset	-1200.06	-1329.91	-5000.00 - 3000.00
Arm Gain	0.0005231	0.0005358	0.000300 - 0.000700
Arm Power	-0.000006027	-0.000006602	-0.000010 - 0.000010

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)	2.02	2.00	-0.02	+/- 0.20
Medium Ring (in)	3.75	3.75	0.00	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.56	6.50	-0.06	+/- 0.20
Medium Ring (in)	8.28	8.25	-0.03	+/- 0.20
Large Ring (in)	15.00	15.00	0.00	+/- 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 - I132M275 **Reference Calibration Date:** 28-Jul-10 22:10:07

Engineer: C. BLUE **Calibration Date:** 06-Aug-10 13:55:07

Software Version: WL INSITE R3.0.4 (Build 6) **Calibration Version:** 1

MEASURED CALIPER VALUES

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.69	-0.06	+/- 0.10
Ring Diameter	8.25	8.12	-0.13	+/- 0.15

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

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name: ACRt - 90199007-E6758-S4352 **Reference Calibration Date:** 14-Apr-10 12:04:15

Engineer: W. MATSON **Calibration Date:** 04-Jun-10 17:35:57

Software Version: WL INSITE R3.0.4 (Build 6) **Calibration Version:** 1

TYPICAL GAIN RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0024	1.05	0.95	1.0046	1.05	0.95	1.0010	1.05
A2 (50")	0.95	1.0183	1.05	0.95	1.0217	1.05	0.95	1.0188	1.05
A3 (29")	0.95	0.9951	1.05	0.95	0.9963	1.05	0.95	0.9928	1.05
A4 (17")	0.95	1.0011	1.05	0.95	1.0007	1.05	0.95	0.9985	1.05
A5 (10")	N/A	N/A	N/A	0.95	0.9975	1.05	0.95	0.9952	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9826	1.05	0.95	0.9790	1.05

TYPICAL SONDE OFFSET RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	-5	-1.190	2	-6	-4.087	-2	-8	-4.712	-2
A2 (50")	-7	-3.214	-1	-6	-4.084	-2	-7	-4.441	-2
A3 (29")	-27	-13.712	-9	-9	-4.012	-3	-7	-3.100	-1
A4 (17")	-180	-98.916	-60	-45	-32.247	-15	-39	-25.618	-13
A5 (10")	N/A	N/A	N/A	-150	-87.784	-50	-80	-43.455	-10

A6 (6")	N/A	N/A	N/A	175	295.461	525	90	150.962	270

TRANSMITTER CURRENT GAIN

Signal	Lower	R	Upper
12K	0.6	0.8983	1.3
36K	1.0	1.8810	2.0
72K	1.0	1.1348	2.0

R-MUD VERIFICATION

Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
Mud Cell	0.95	1.009	1.05

CALIBRATION SUMMARY

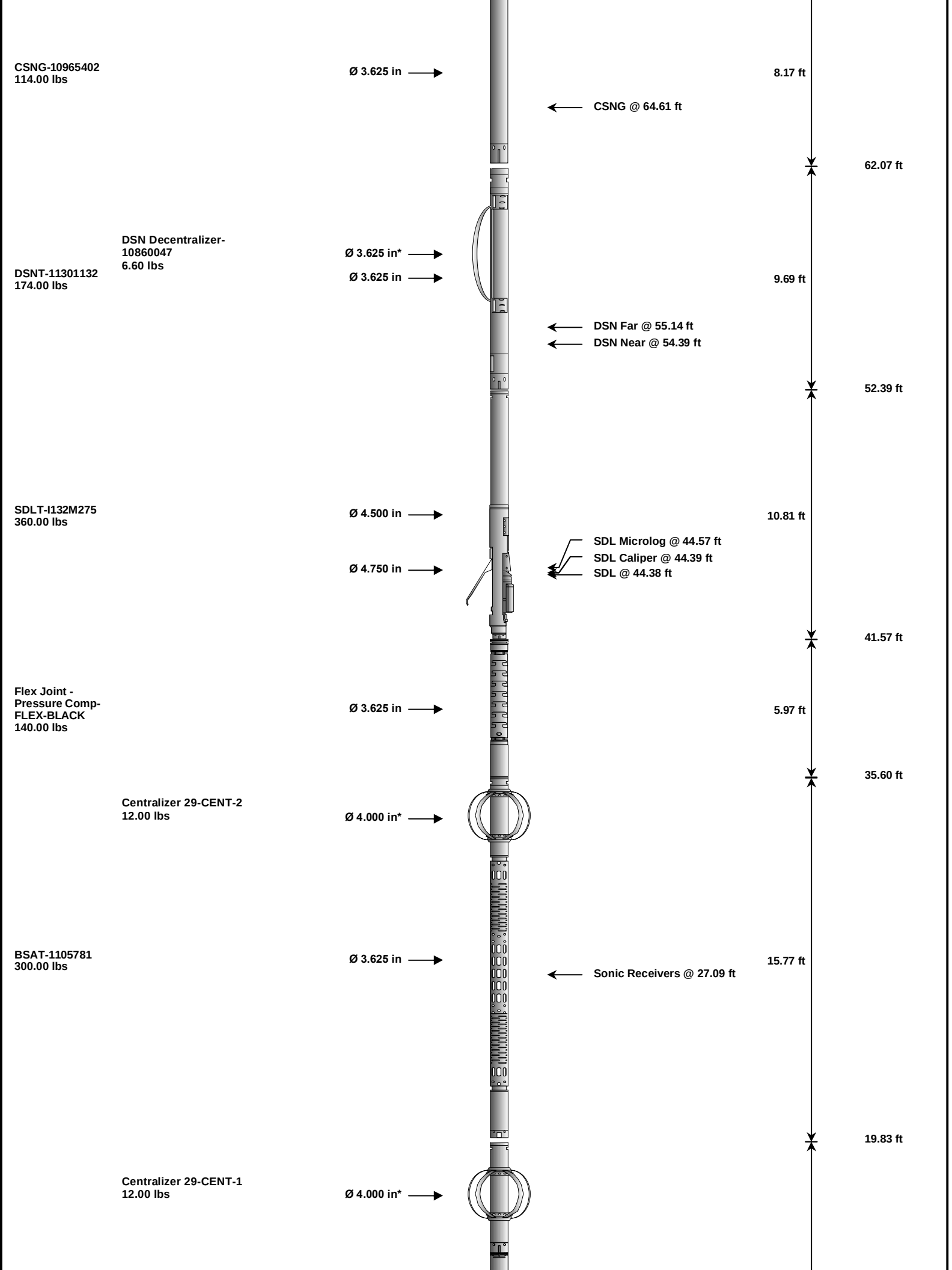
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11277436						
Gamma Ray Calibrator	234.0	231.0	----------	3.0	+/- 9.00	api
CSNG-10965402						
60 KEV Peak Channel #	48.0	48.0	----------	0.0	----------	Channel #
239 KEV Peak Channel #	22.7	23.0	----------	-0.3	----------	Channel #
583 KEV Peak Channel #	51.1	51.2	----------	-0.1	----------	Channel #
2614 KEV Peak Channel #	209.6	210.8	----------	-1.2	----------	Channel #
DSNT-11301132						
Snow-Block Porosity	0.0866	0.0812	----------	0.0054	+/- 0.0150	decp
SDLT-I132M275						
Near(B+D+P+L)	1577.897	1574.409	----------	3.488	+/-15.980	cps
Far(B+D+P+L)	865.263	869.785	----------	-4.522	+/-16.093	cps
MicroLog Normal	19.93	19.93	----------	0.00	+/-0.80	ohmm
MicroLog Lateral	19.99	20.00	----------	-0.01	+/-0.80	ohmm
Pad Extension	3.75	3.69	----------	0.06	+/-0.10	in
Ring Diameter	8.25	8.12	----------	0.130	+/-0.15	in
ACRt-90199007-E6758-S4352						
Mud Cell	1.009	----------	----------	0.000	----------	ohm-m

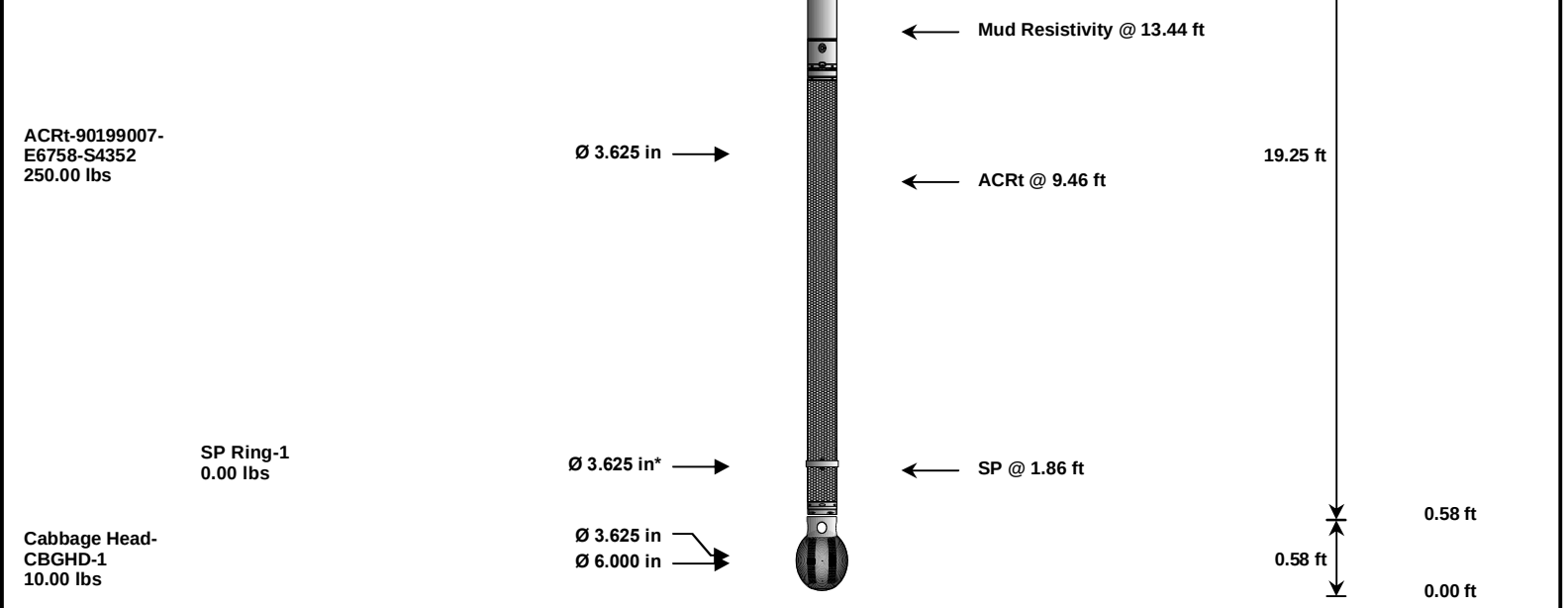
Data: STATE_PC_GC36\0001 NOBLE_BLACK_BSAT\IDLE **Date: 06-Aug-10 23:42:26**

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
						85.01 ft
RWCH-A094 135.00 lbs		Ø 3.625 in		Load Cell @ 81.33 ft BH Temperature @ 80.76 ft	6.25 ft	
						78.76 ft
GTET-11277436 165.00 lbs		Ø 3.625 in		GammaRay @ 72.70 ft	8.52 ft	
						70.24 ft


CSNG-10965402
114.00 lbs
Ø 3.625 in
CSNG @ 64.61 ft
8.17 ft
62.07 ft
DSN Decentralizer-
10860047
6.60 lbs
Ø 3.625 in*
DSNT-11301132
174.00 lbs
Ø 3.625 in
9.69 ft
DSN Far @ 55.14 ft
DSN Near @ 54.39 ft
52.39 ft
SDLT-I132M275
360.00 lbs
Ø 4.500 in
10.81 ft
SDL Microlog @ 44.57 ft
SDL Caliper @ 44.39 ft
SDL @ 44.38 ft
Ø 4.750 in
41.57 ft
Flex Joint -
Pressure Comp-
FLEX-BLACK
140.00 lbs
Ø 3.625 in
5.97 ft
35.60 ft
Centralizer 29-CENT-2
12.00 lbs
Ø 4.000 in*
BSAT-1105781
300.00 lbs
Ø 3.625 in
15.77 ft
Sonic Receivers @ 27.09 ft
19.83 ft
Centralizer 29-CENT-1
12.00 lbs
Ø 4.000 in*



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)		Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head	A094	135.00	6.25		78.76	300.00
GTET	Gamma Telemetry Tool	11277436	165.00	8.52		70.24	60.00
CSNG	Compensated Spectral Natural Gamma	10965402	114.00	8.17		62.07	15.00
DSNT	Dual Spaced Neutron	11301132	174.00	9.69		52.39	60.00
DCNT	DSN Decentralizer	10860047	6.60	5.13	*	55.72	300.00
SDLT	Spectral Density Tool	I132M275	360.00	10.81		41.57	60.00
FLEX	Flex Joint - Pressure Compensated	FLEX-BLACK	140.00	5.97		35.60	300.00
BCAS	Borehole Sonic Array Tool	1105781	300.00	15.77		19.83	60.00
OBCEN	Centralizer - 29 in.Overbody	CENT-2	12.00	2.42	*	32.66	300.00
ACRt	Array Compensated True Resistivity	90199007-E6758-S4352	250.00	19.25		0.58	300.00
SP	SP Ring	1	0.00	0.25	*	1.86	300.00
OBCEN	Centralizer - 29 in.Overbody	CENT-1	12.00	2.42	*	16.29	300.00
CBHD	Cabbage Head	CBGHD-1	10.00	0.58		0.00	300.00
Total			**1,678.60**	**85.01**			

* Not included in Total Length and Length Accumulation.

Data: STATE_PC_GC36\0001 NOBLE_BLACK_BSAT\IDLE **Date: 06-Aug-10 22:58:17**

COMPANY	**NOBLE ENERGY**		
WELL	**STATE PC GC36-16**		
FIELD	**WATTENBERG**		
COUNTY	**WELD**	STATE	**CO**

HALLIBURTON

SPECTRAL DENSITY
DUAL SPACED NEUTRON
ARRAY COMPENSATED
TRUE RESISTIVITY