

HALLIBURTON

DUAL SPACED NEUTRON  
SPECTRAL DENSITY  
ARRAY COMPENSATED  
TRUE RESISTIVITY

COMPANY		ENCANA OIL & GAS (USA) INC.			
WELL		FEDERAL SMITH 21-12			
FIELD		PARACHUTE			
COUNTY		GARFIELD			
STATE		CO			
Permanent Datum		GL	Elev. 6149.7 ft		Elev. K.B.
Log measured from		KB	13.5 ft above perm. Datum		D.F.
Drilling measured from		KB	6149.7 ft		G.L.
Date	12-Sep-08				
Run No.	ONE				
Depth - Driller	7306.0 ft				
Depth - Logger	7300.0 ft				
Bottom - Logged Interval	7287.0 ft				
Top - Logged Interval	950.0 ft				
Casing - Driller	8.625 in @ 985.0 ft				
Casing - Logger	980.0 ft				
Bit Size	7.875 in				
Type Fluid in Hole	WATER BASED				
Density	10.2 ppg	75.00	s/qt		
PH	9.00 pH	6.4	cpm		
Source of Sample	MUD TANK				
Rm @ Meas. Temperature	2.76 ohmm @ 66.00 degF				
Rmf @ Meas. Temperature	1.92 ohmm @ 65.00 degF				
Rmc @ Meas. Temperature	3.30 ohmm @ 64.00 degF				
Source Rmf	MEASURED	MEASURED			
Rm @ BHT	1.14 ohmm @ 169.0 degF				
Time Since Circulation	6.0 hr				
Time on Bottom	12-Sep-08 12:31				
Max. Rec. Temperature	169.0 degF @ 7300.0 ft				
Equipment	10355132	VERNAL, UT			
Recorded By	J. CONRAD				
Witnessed By	TONY KETTERLING				

Fold here

Service Ticket No.: 6168098				API Serial No.: 050451545600				PGM Version: WL INSITE R2.2 (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-1907S909	N/A	1.5" STANDOFF	N/A				
Rmc @ Meas. Temp.		@		@										
Source Rmf	Rmc													
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.	11016182		Serial No.			Serial No.	10951319		Serial No.	11004663				
Model No.	GTET		Model No.			Model No.	SDLT-I		Model No.	DSNT-I				
Diameter	3.625"		No. of Cent.			Diameter	4.5"		Diameter	3.625"				
Detector Model No.	GTET		Spacing			Log Type	GAM-GAM		Log Type	THERMAL				
Type	SCINT.					Source Type	Cs137		Source Type	Am241Be				
Length	8"		LSA [Y/N]			Serial No.	5116GW		Serial No.	DSN-32				
Distance to Source	10'		FWDA [Y/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				
No.	From	To	ft/min	L	R	L	R		L	R					
ONE	TD	CASING	REC.	0	200				30%	-10%	2.68 g/cc	30%	-10%	SAND	
DIRECTIONAL INFORMATION															
Maximum Deviation								@	KOP				@		
Remarks:															
TOOL STRING CONFIGURATION RUN IN COMBINATION: RWCH/DSNT/SDLT/ACRT/CENT															
HOLE RUGOSITY AND TENSION PULLS MAY AFFECT LOG QUALITY AND REPEATABILITY															
ANNULAR HOLE VOLUME CALCULATED USING 4.5 INCH CASING															
CHLORIDES: 600 mg/L															
LATITUDE: 39.42152 N LONGITUDE: 108.00341 W															
CREW: J.HERBERT, R.MAYBURY															
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES, VERNAL, UT 435-789-2550															
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.															
HALLIBURTON															

Depth (ft)	Tool Name	Description	Value	Units
TOP				
	SHARED	Bit Size	7.875	in
	SHARED	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	Borehole Fluid Weight	10.200	ppg
	SHARED	Mud Resistivity	2.760	ohmm
	SHARED	Temperature of Mud	66.0	degF
	SHARED	Oil Based Mud System?	No	
	SHARED	Logging Interval is Cased?	No	
	SHARED	AHV Casing OD	4.500	in
	SHARED	Surface Temperature	65.0	degF
	SHARED	Total Well Depth	7300.00	ft
	SHARED	Bottom Hole Temperature	169.0	degF
	Rwa / CrossPlot	Process Crossplot?	Yes	
	Rwa / CrossPlot	Select Source of F	Automatic	
	Rwa / CrossPlot	Archie A factor	0.6200	
	Rwa / CrossPlot	Archie M factor	2.1500	
	Rwa / CrossPlot	Rmf Reference	0.10	ohmm
	Rwa / CrossPlot	Rmf Ref Temp	75.00	degF
	Rwa / CrossPlot	Resistivity of Formation Water	0.05	ohmm
	GTET	Process Gamma Ray?	Yes	
	GTET	Gamma Tool Standoff	0.000	in
	GTET	Process Gamma Ray EVR?	No	
	DSNT	Process DSN?	Yes	
	DSNT	Process DSN EVR?	No	
	DSNT	Neutron Lithology	Sandstone	

DSNT	Neutron Elasticity	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	Use Calibration Blocks?	No	
SDLT	SDLT Pad Temperature Valid?	Yes	
SDLT	Disable temperature warning	No	
SDLT	Weighted Mud Correction Type?	Barite	
SDLT	Formation Density Matrix	2.680	g/cc
SDLT	Formation Density Fluid	1.000	g/cc
SDLT	Process Caliper Outputs?	Yes	
SDLT	Process MicroLog Outputs?	Yes	
ACRt	Process ACRt?	Yes	
ACRt	Casing Indicator Enabled?	Yes	
ACRt	Relative Caliper Error	0	%
ACRt	Minimum Tool Standoff	1.50	in
ACRt	Use RM Calculated for BHC?	No	
ACRt	Calculate Temperature for Rmud Correction?	No	
ACRt	Acrt Lateral Normalization	None	
ACRt	Use Temperature Correction	Yes	
ACRt	Temperature Correction Source	FP Lwr & FP Up	
ACRt	Tool Position	Standoff	
ACRt	Borehole Compensation Type	Conventional	
ACRt	Minimum Resistivity for MAP	0.20	ohmm
ACRt	Maximum Resistivity for MAP	200.00	ohmm
ACRt	Record 6 in curves in ADI?	No	

BOTTOM

Data: FED\_SMITH\_21\_12\0001 LOGIC TRIPLE COMBO\IDLE

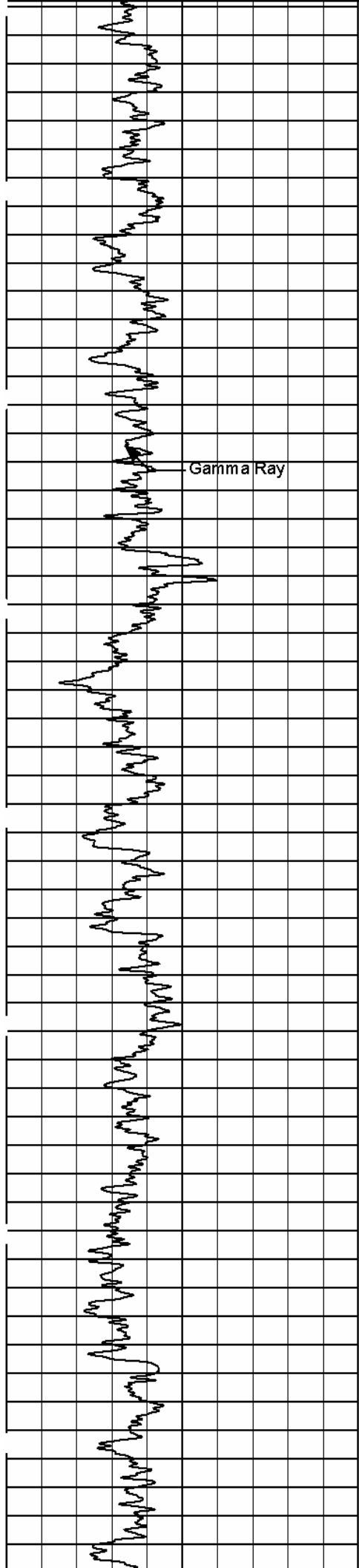
Date: 12-Sep-08 14:19:52

**HALLIBURTON**

Plot Time: 12-Sep-08 16:31:37  
Plot Range: 98 ft to 7320 ft  
Data: FED\_SMITH\_21\_12\Well Based\MAIN\  
Plot File: \\TRIPLE\ENCANA\_2IN\_ACRt

**MAIN PASS 2" = 100'**

			10K Tens 0 pounds  1 : 600 FT.			
0	Gamma Ray	200		500 90in Conductivity 0		
api				MMHO		
0	SP	100		0	90in Resistivity	100
-]10[+				OHM-M		
6	Caliper	16		0	10in Resistivity	100
inches			OHM-M			



100

200

300

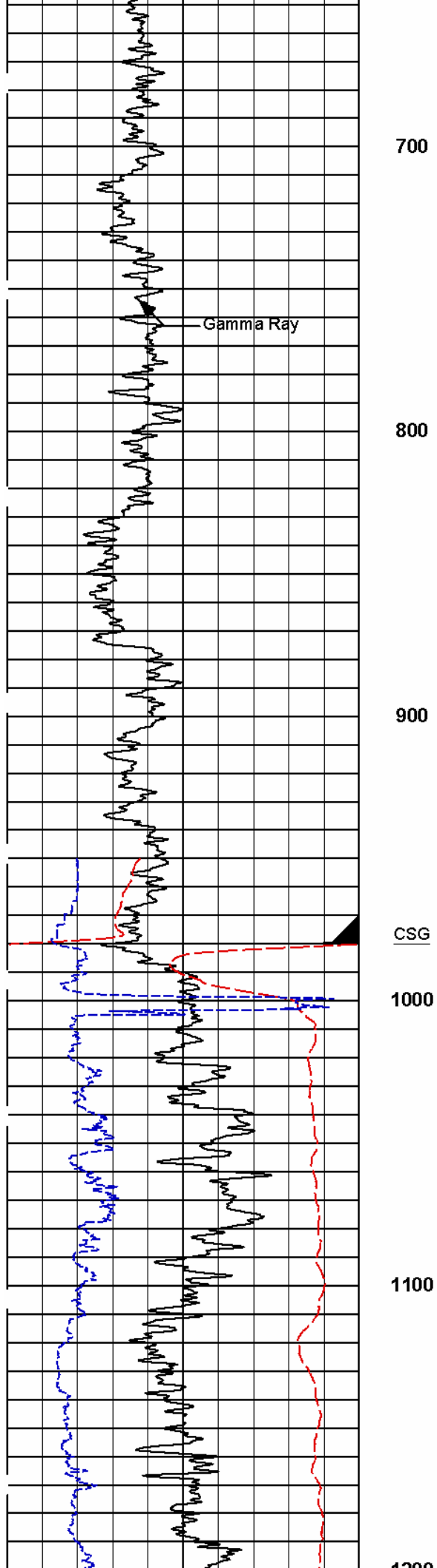
400

500

600

Gamma Ray

Tens



700

Gamma Ray

800

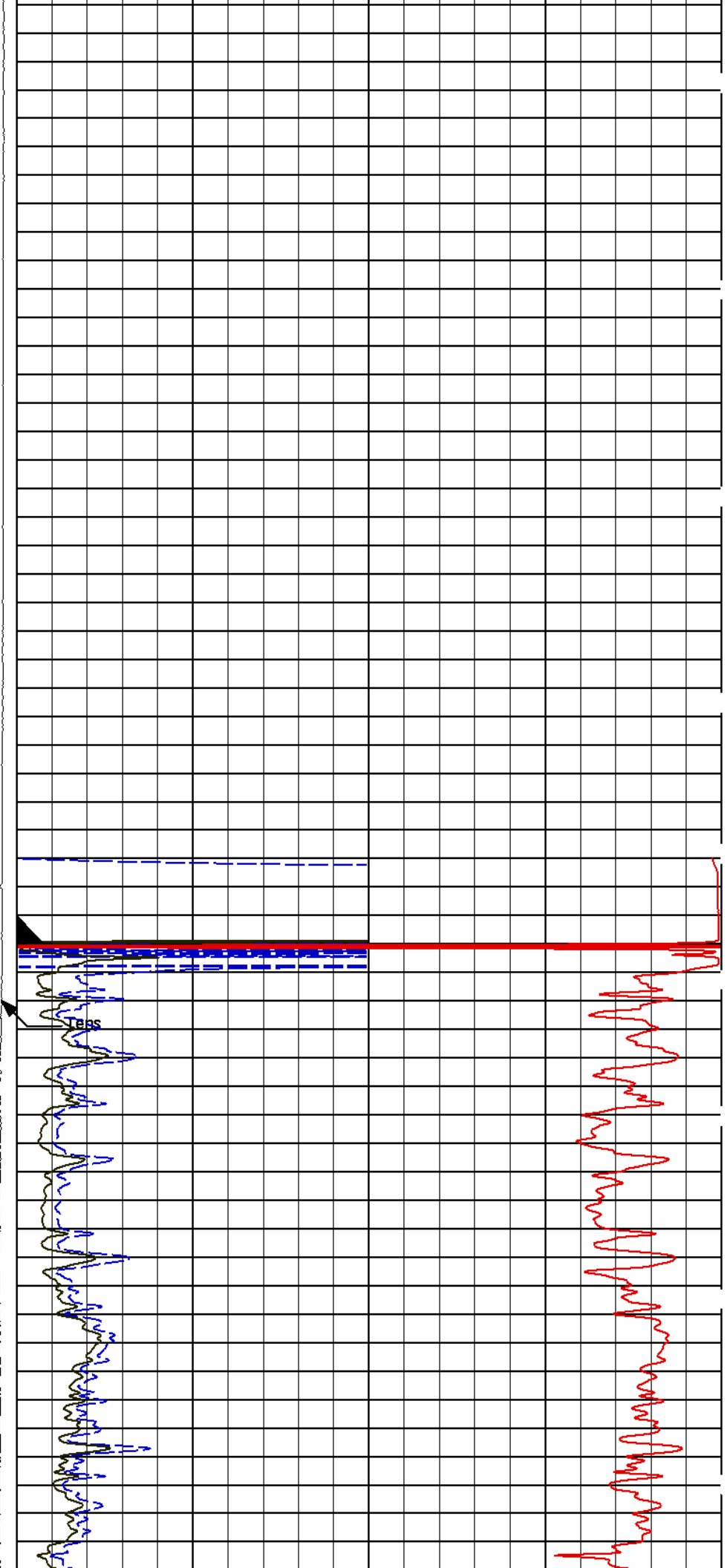
900

CSG

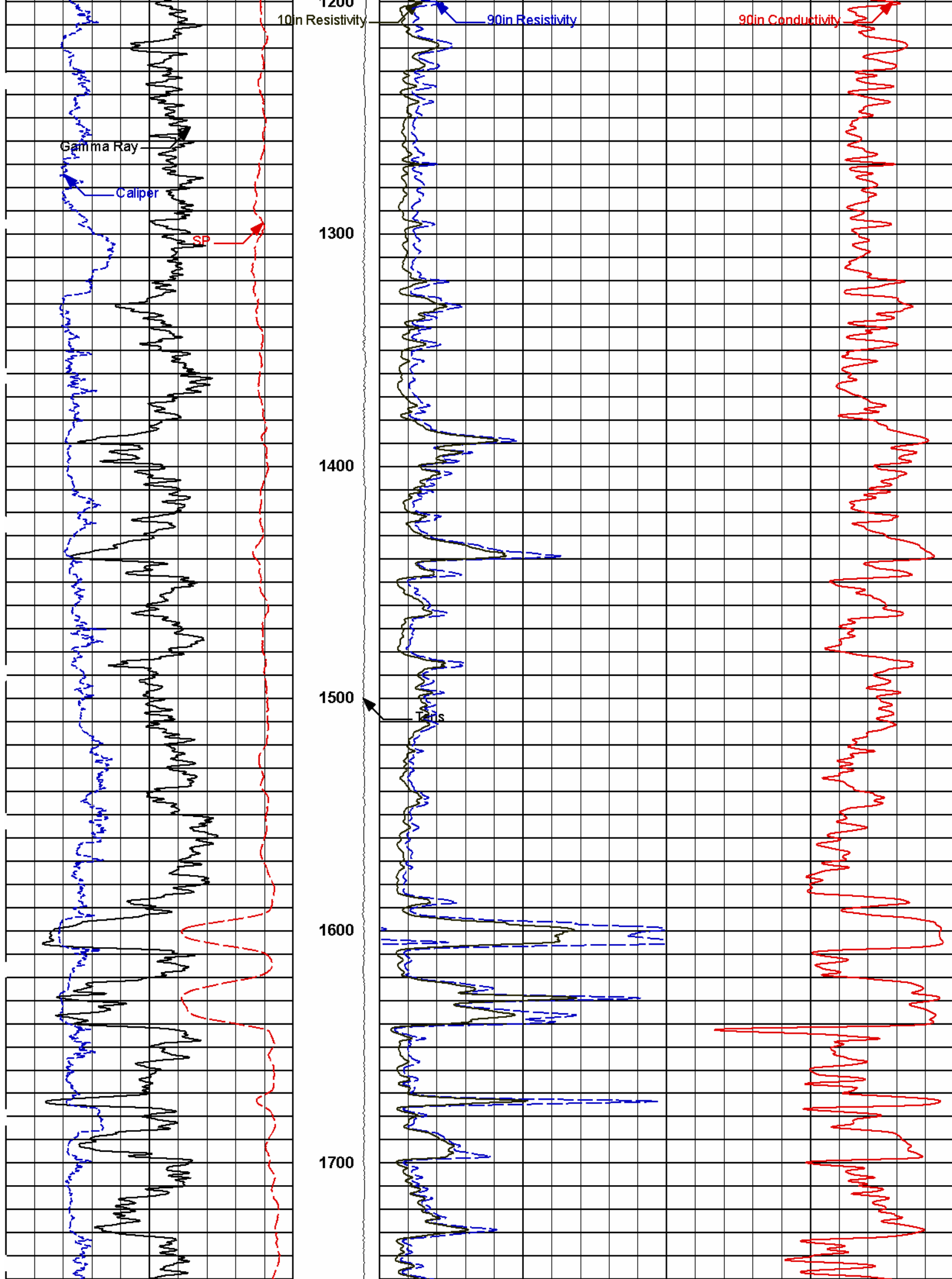
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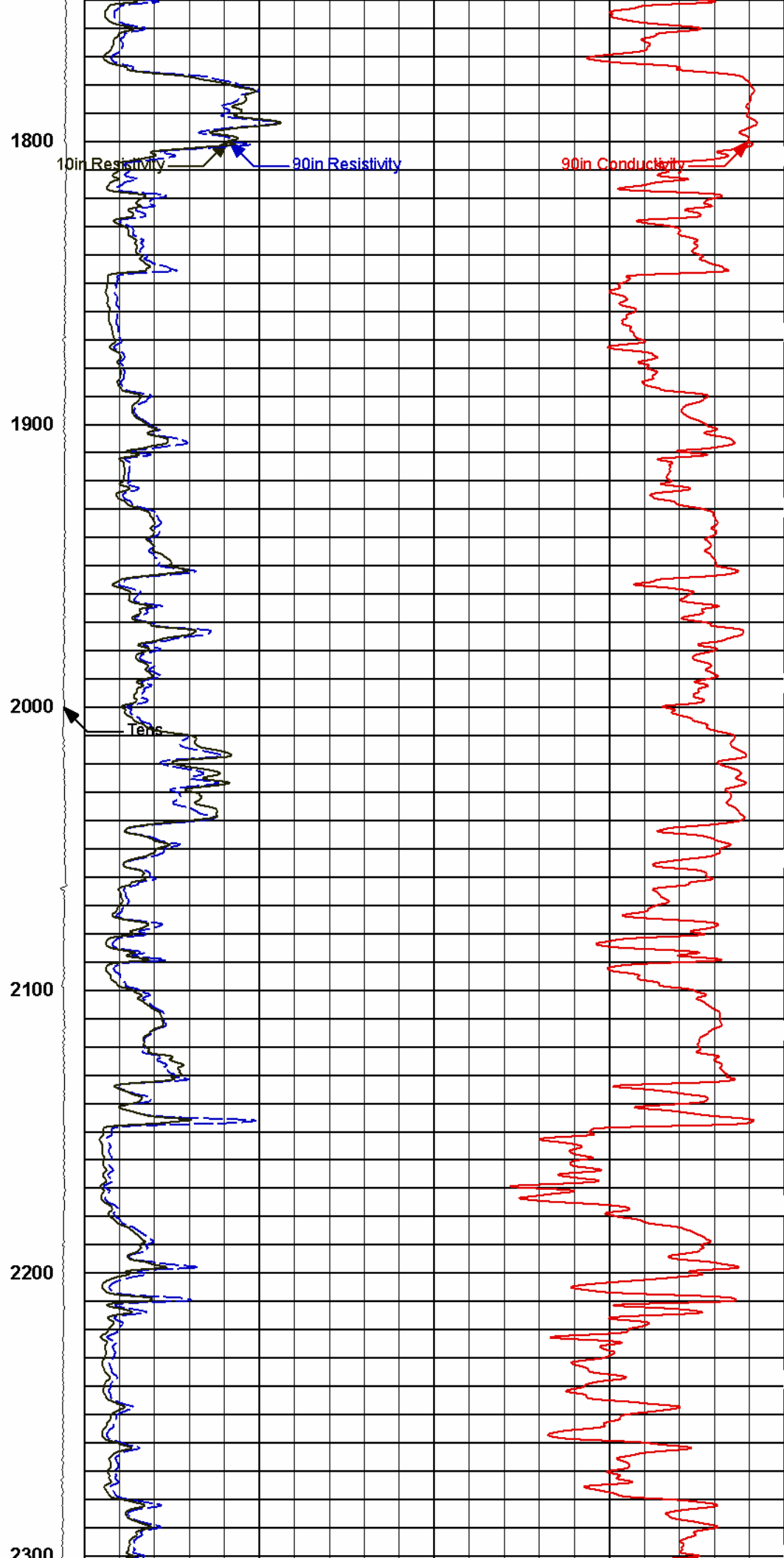
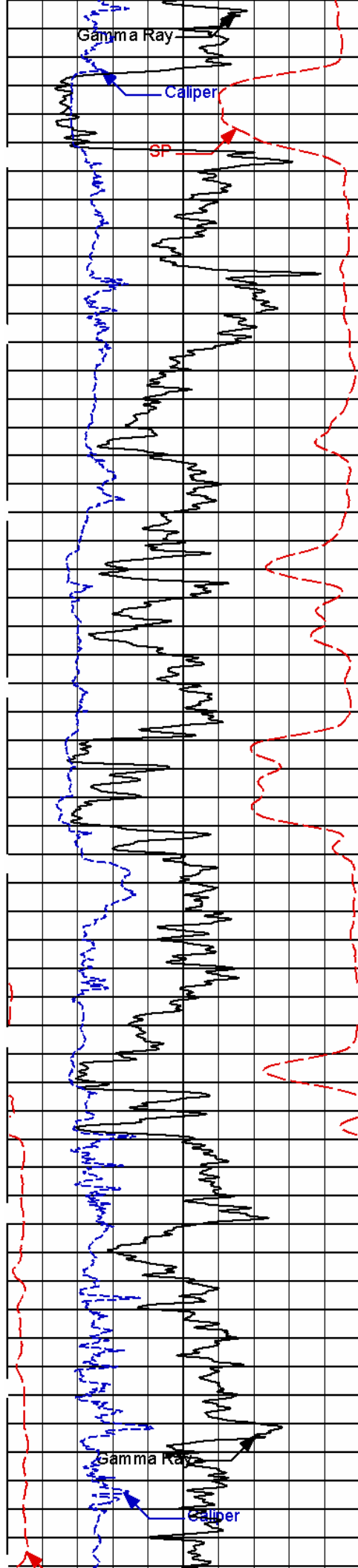
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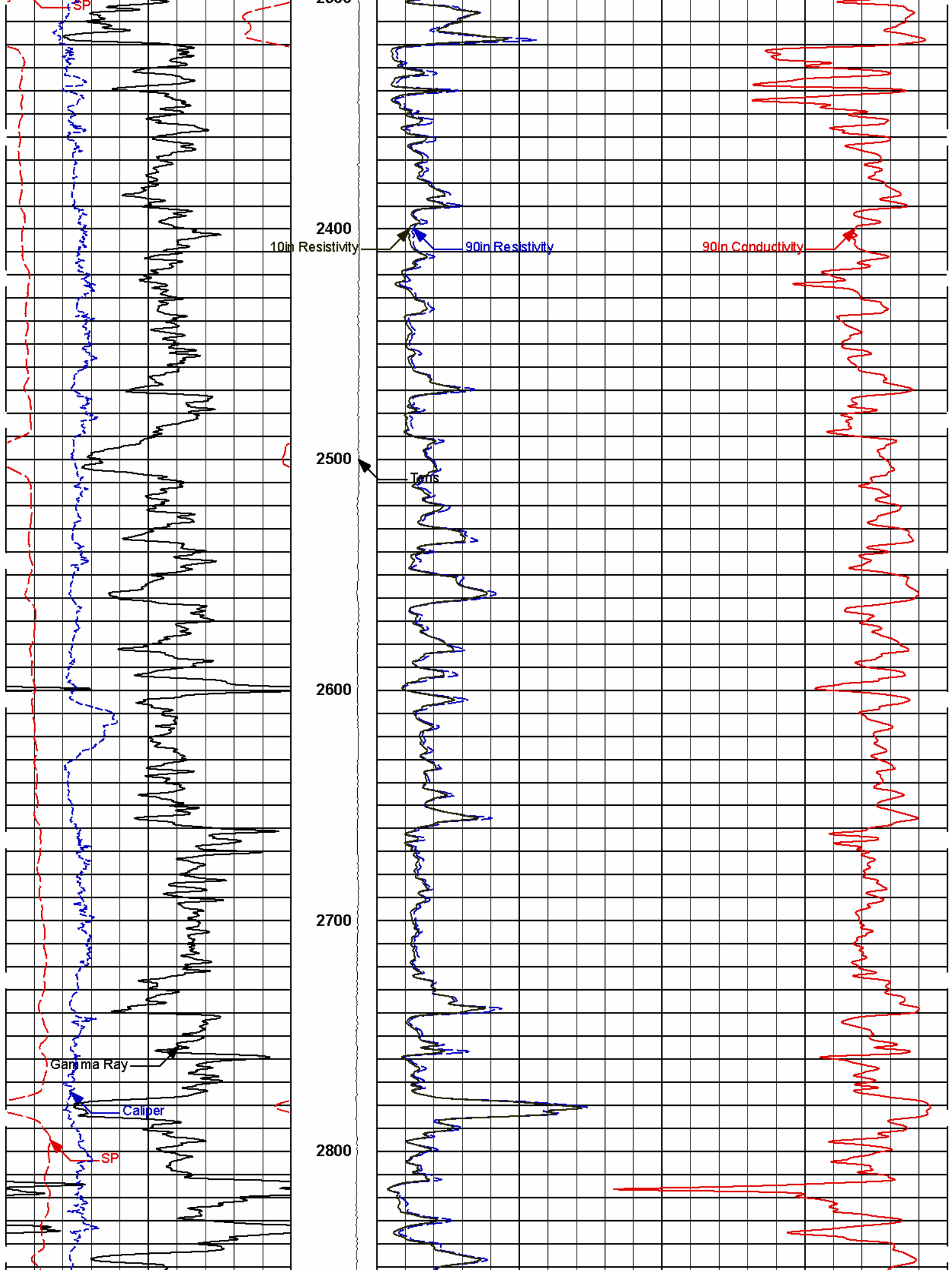
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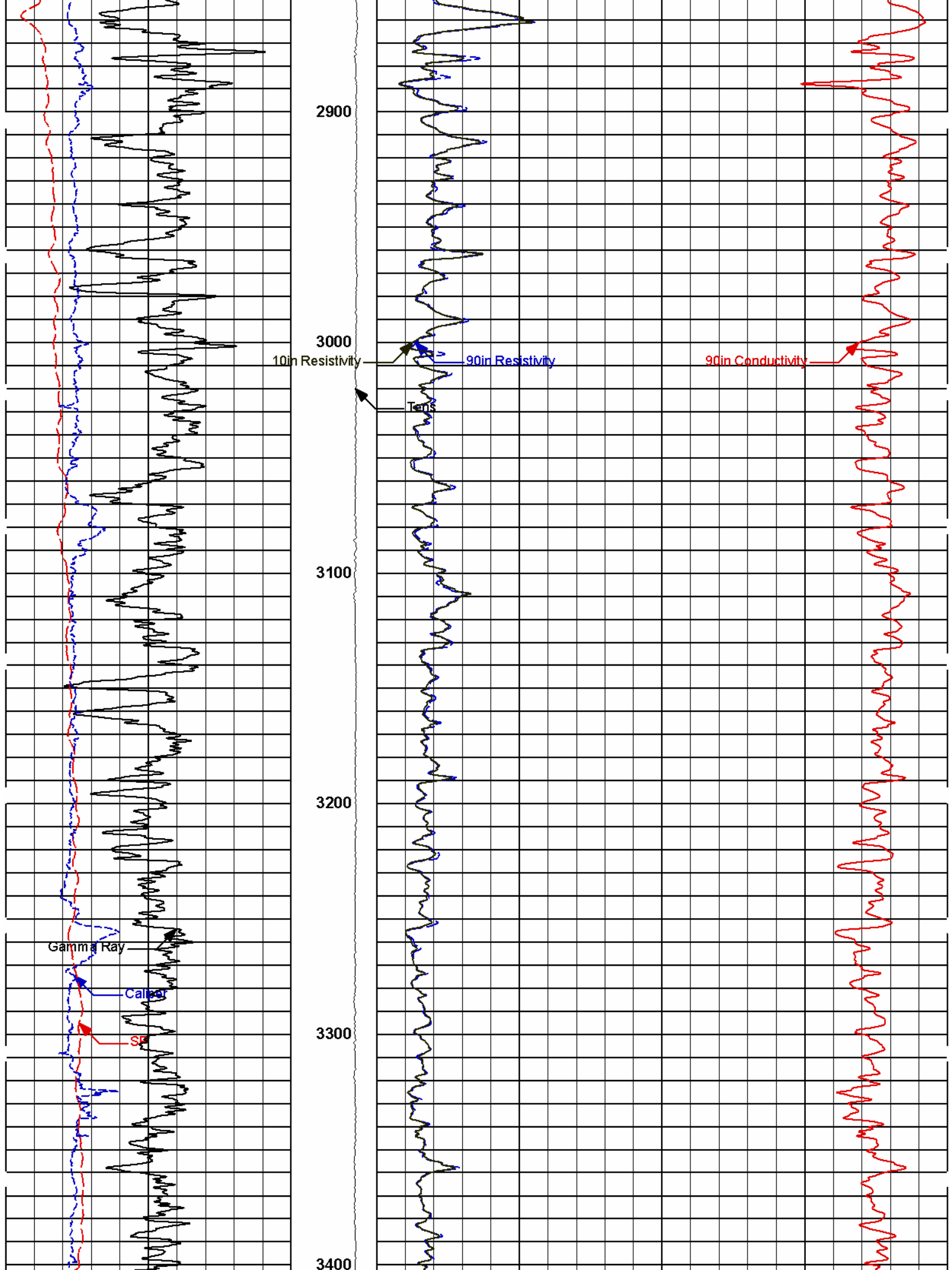


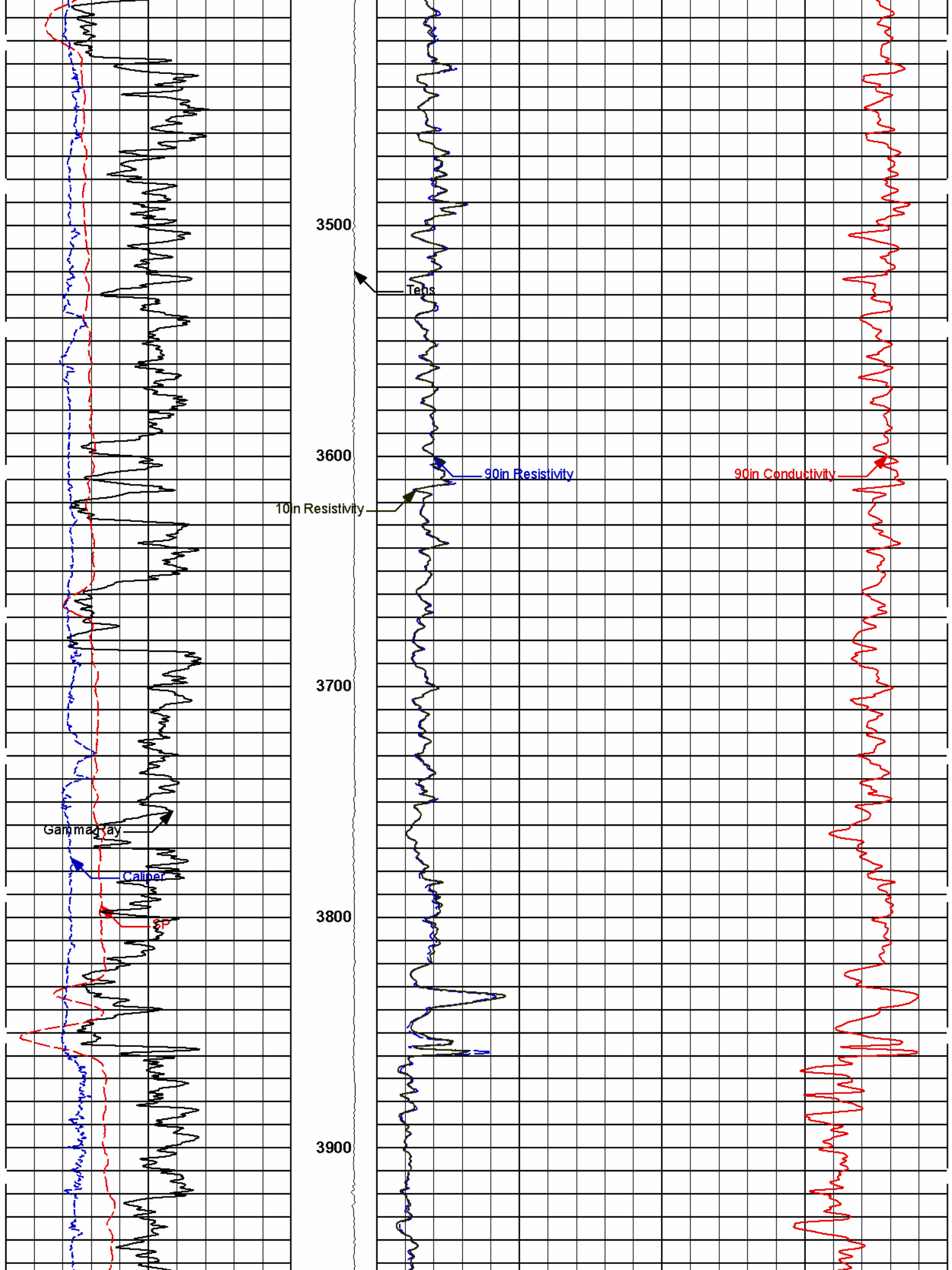
Red

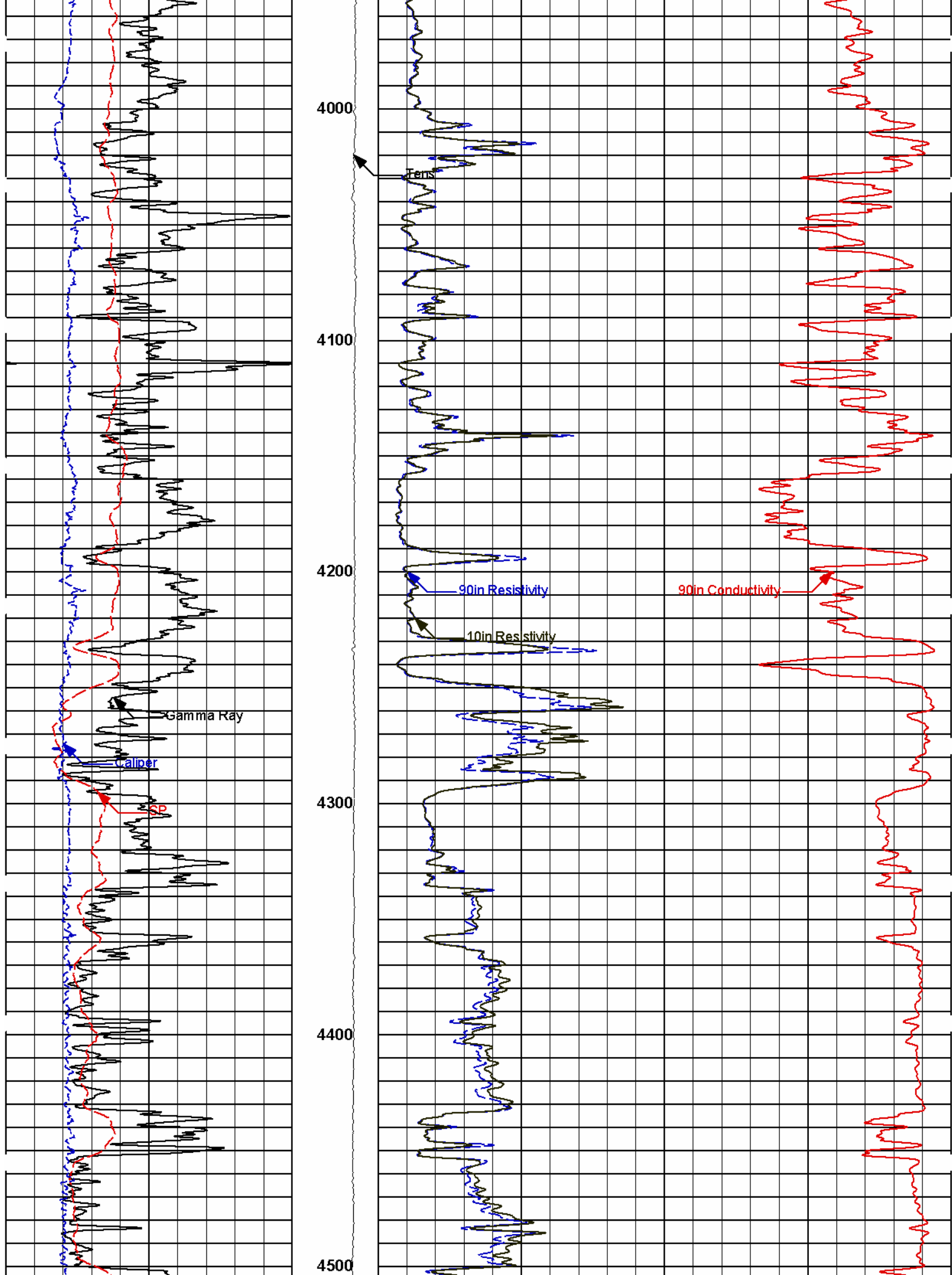


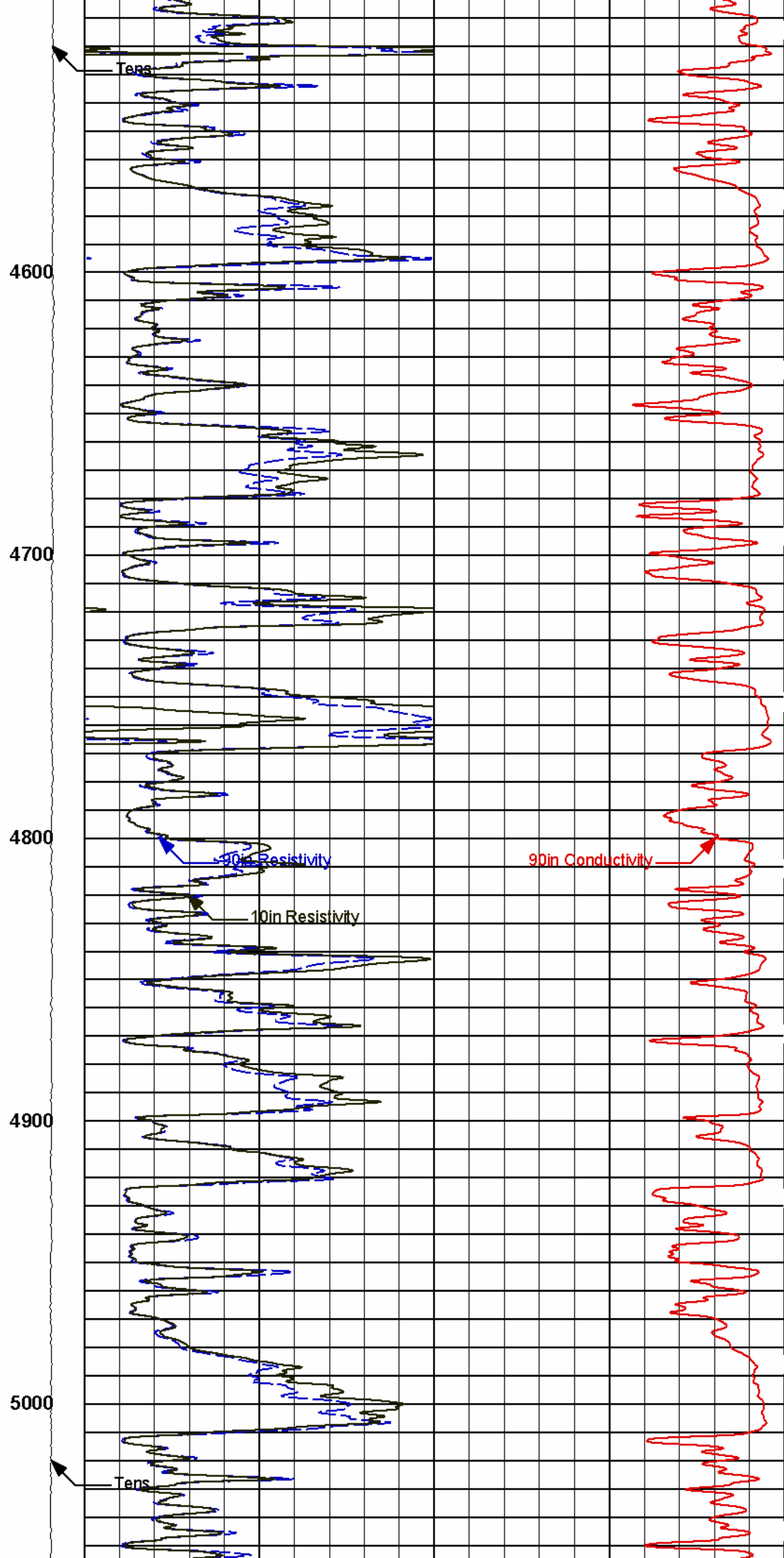
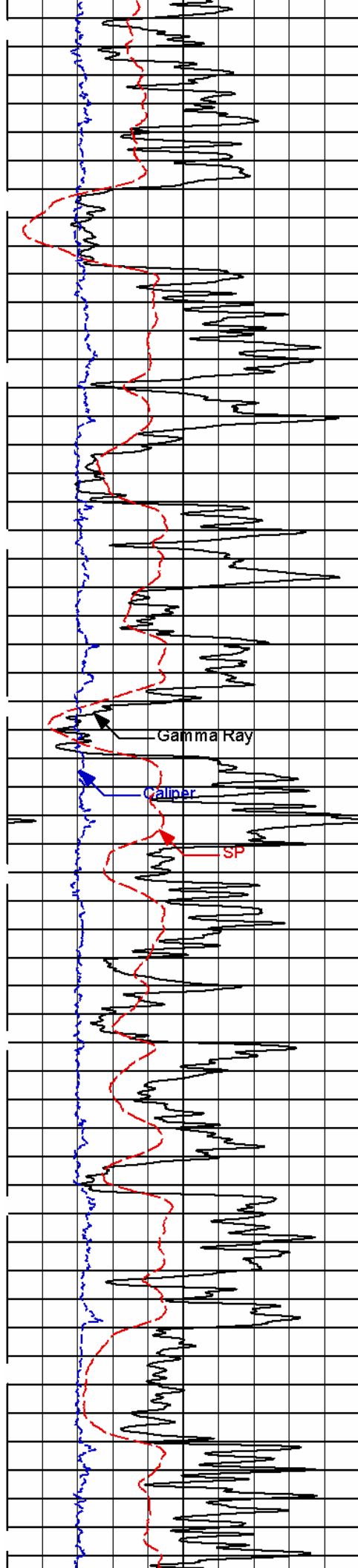


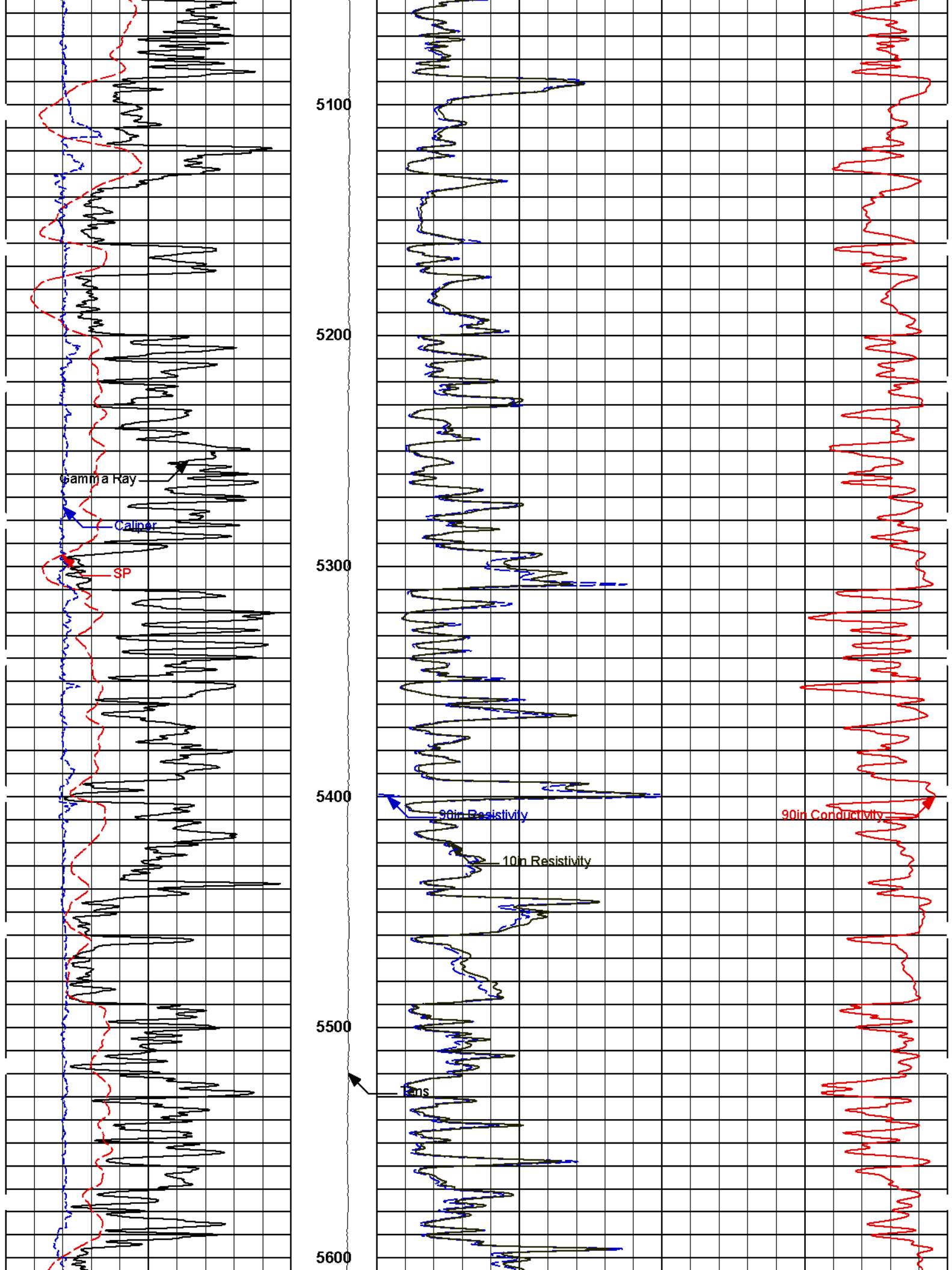


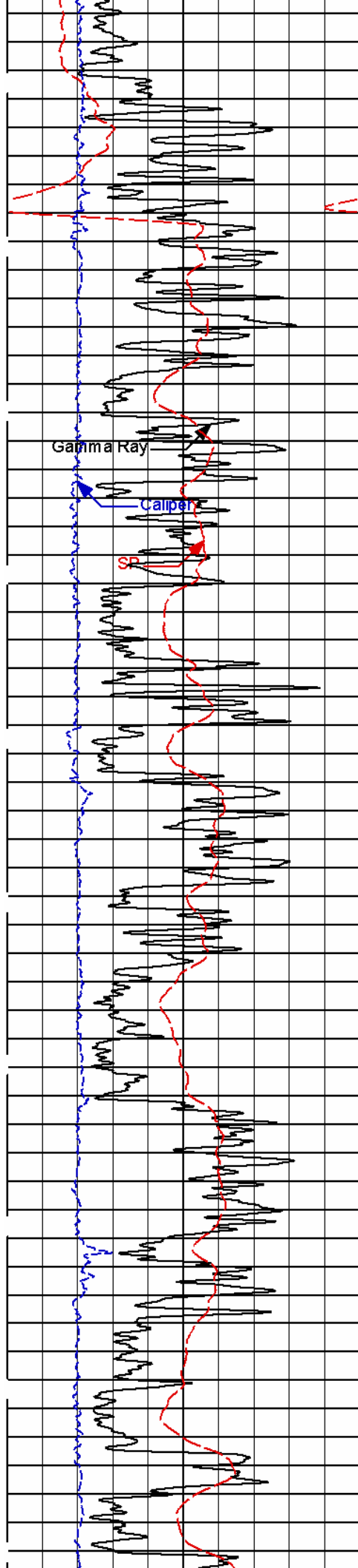












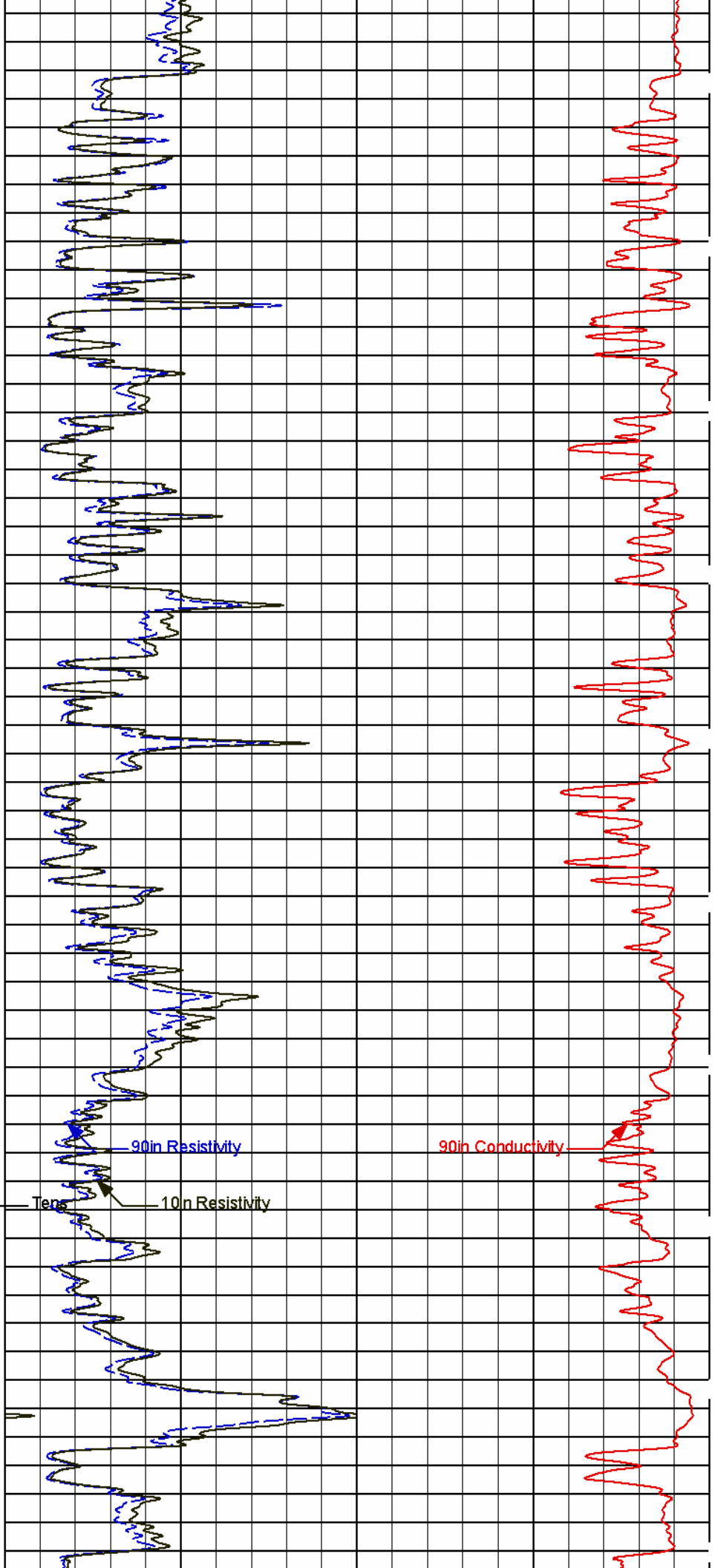
5700

5800

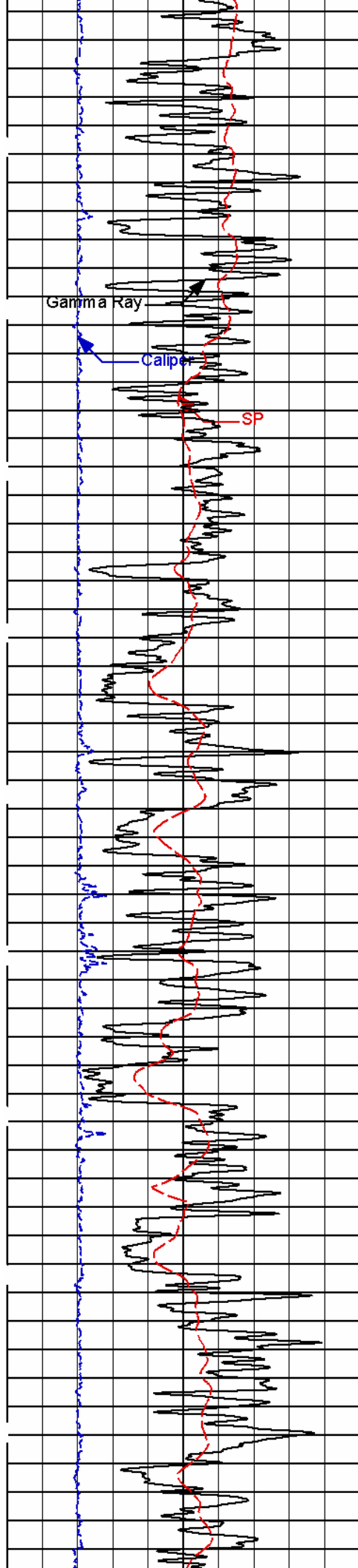
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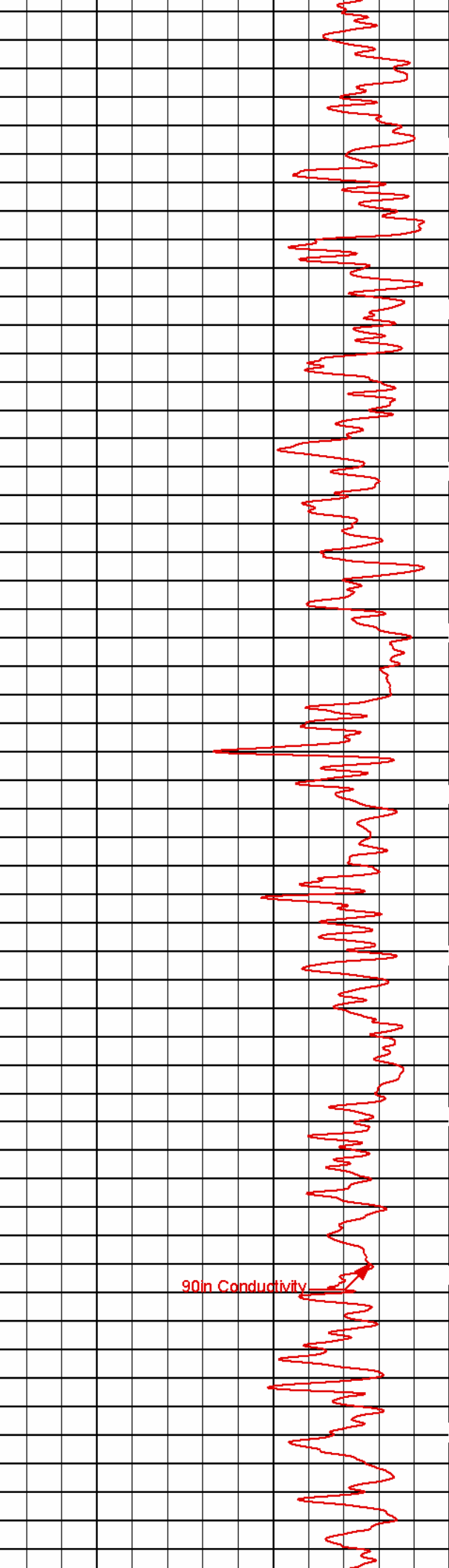
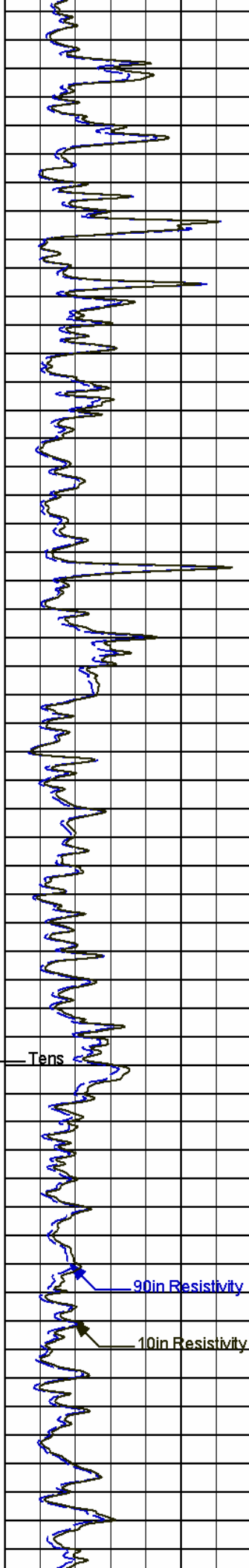
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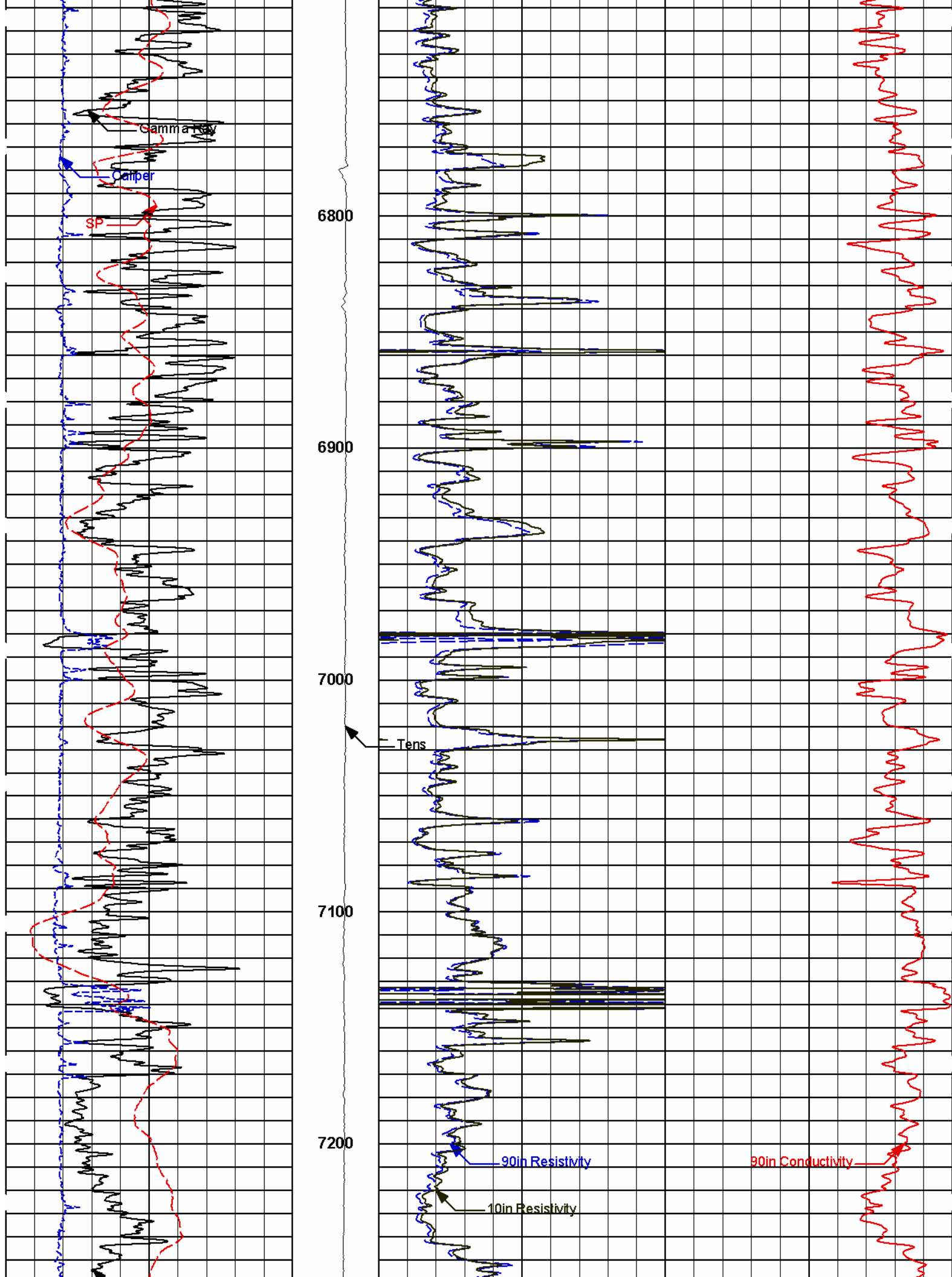


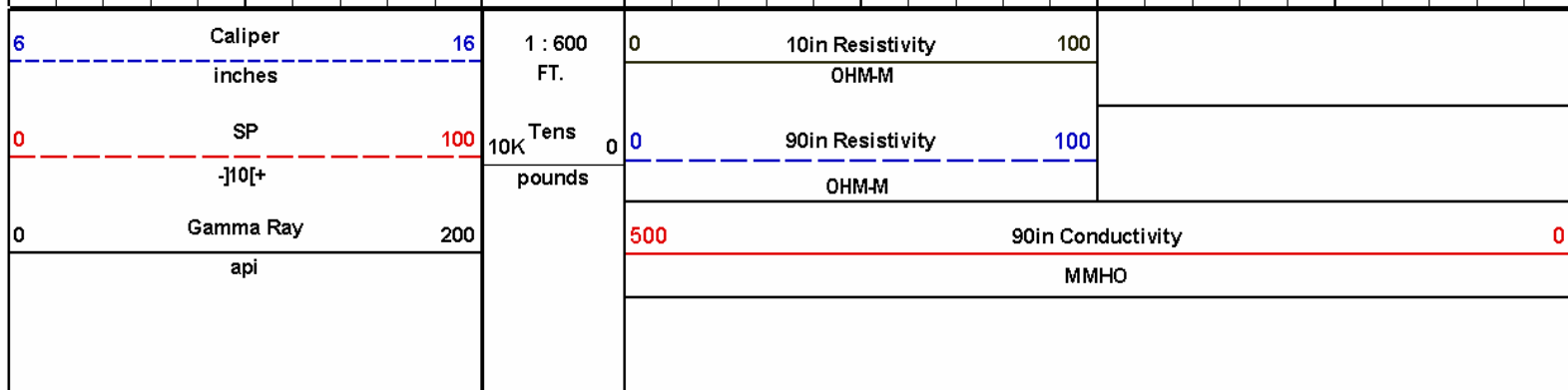
Tens



6200  
6300  
6400  
6500  
6600  
6700





**HALLIBURTON**

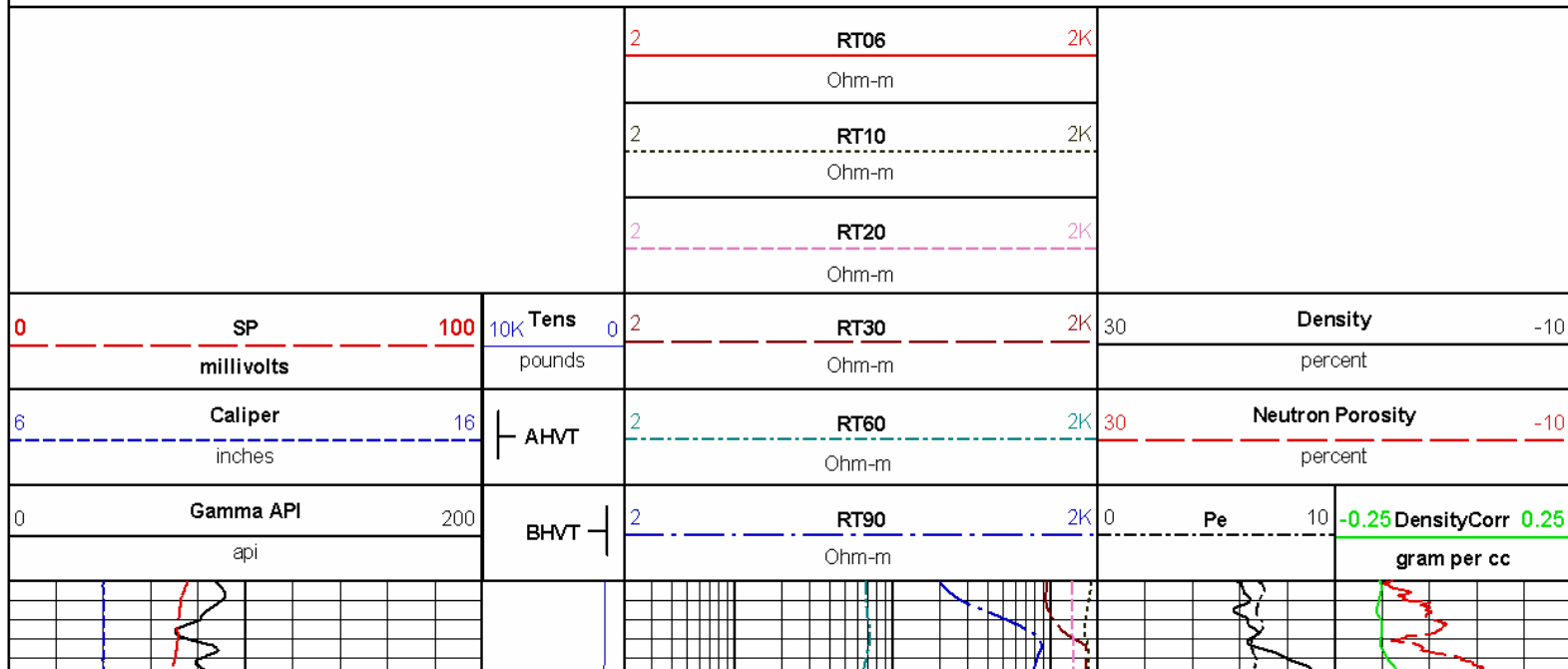
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Data: FED\_SMITH\_21\_12\Well Based\MAIN  
Plot File: \\TRIPLEENCANA\_2\N ACRT

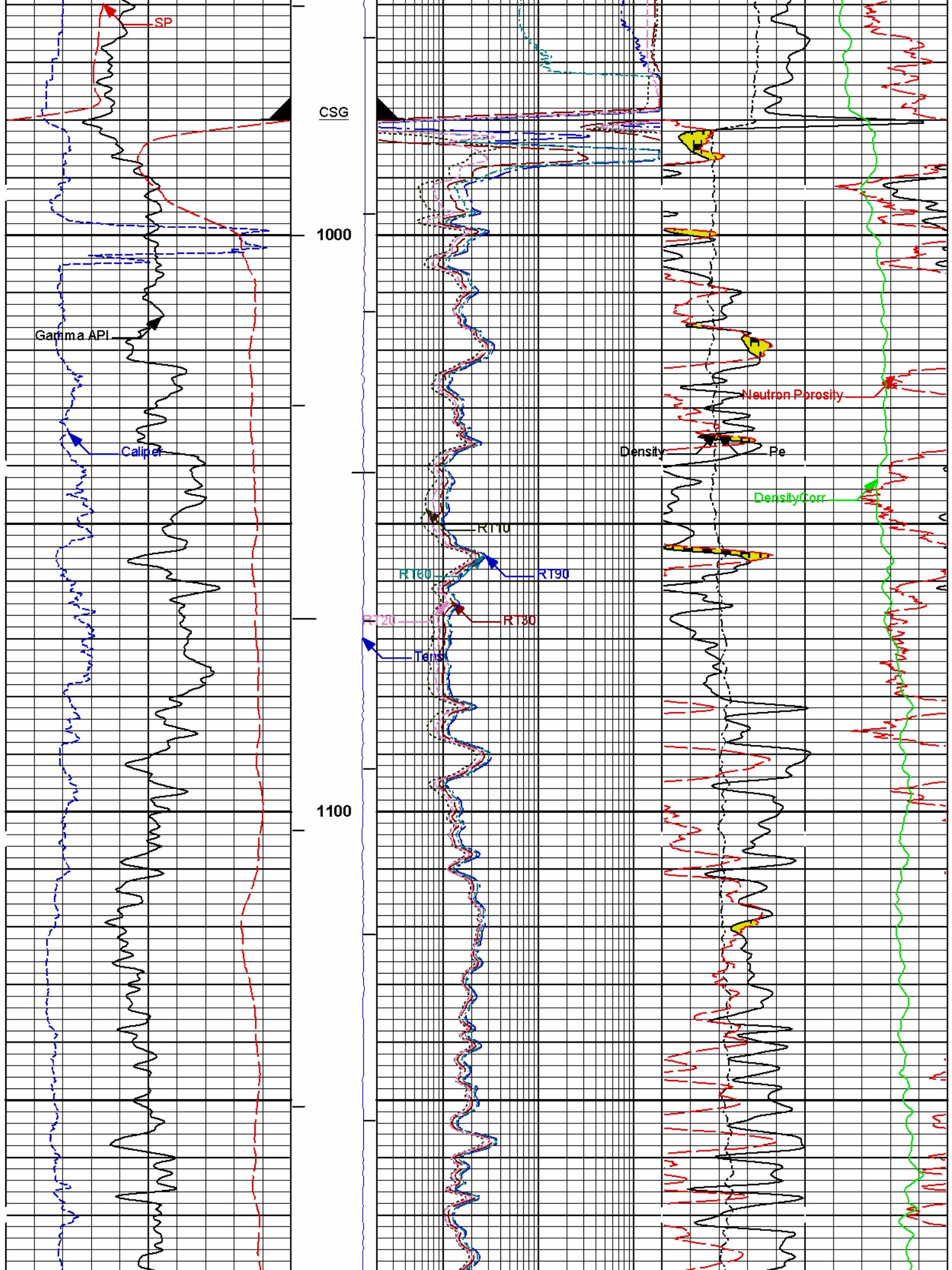
**MAIN PASS 2" = 100'**

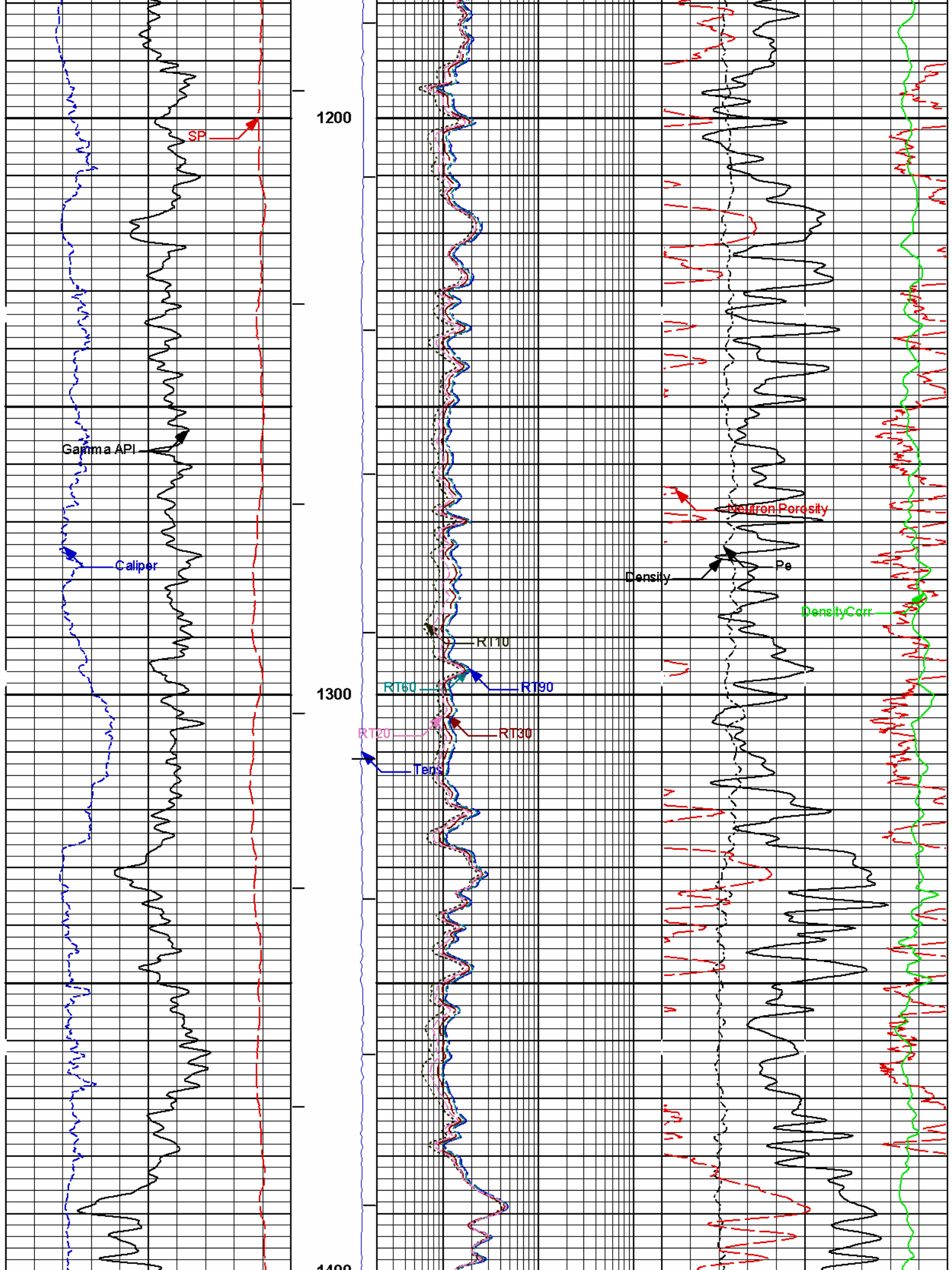
**HALLIBURTON**

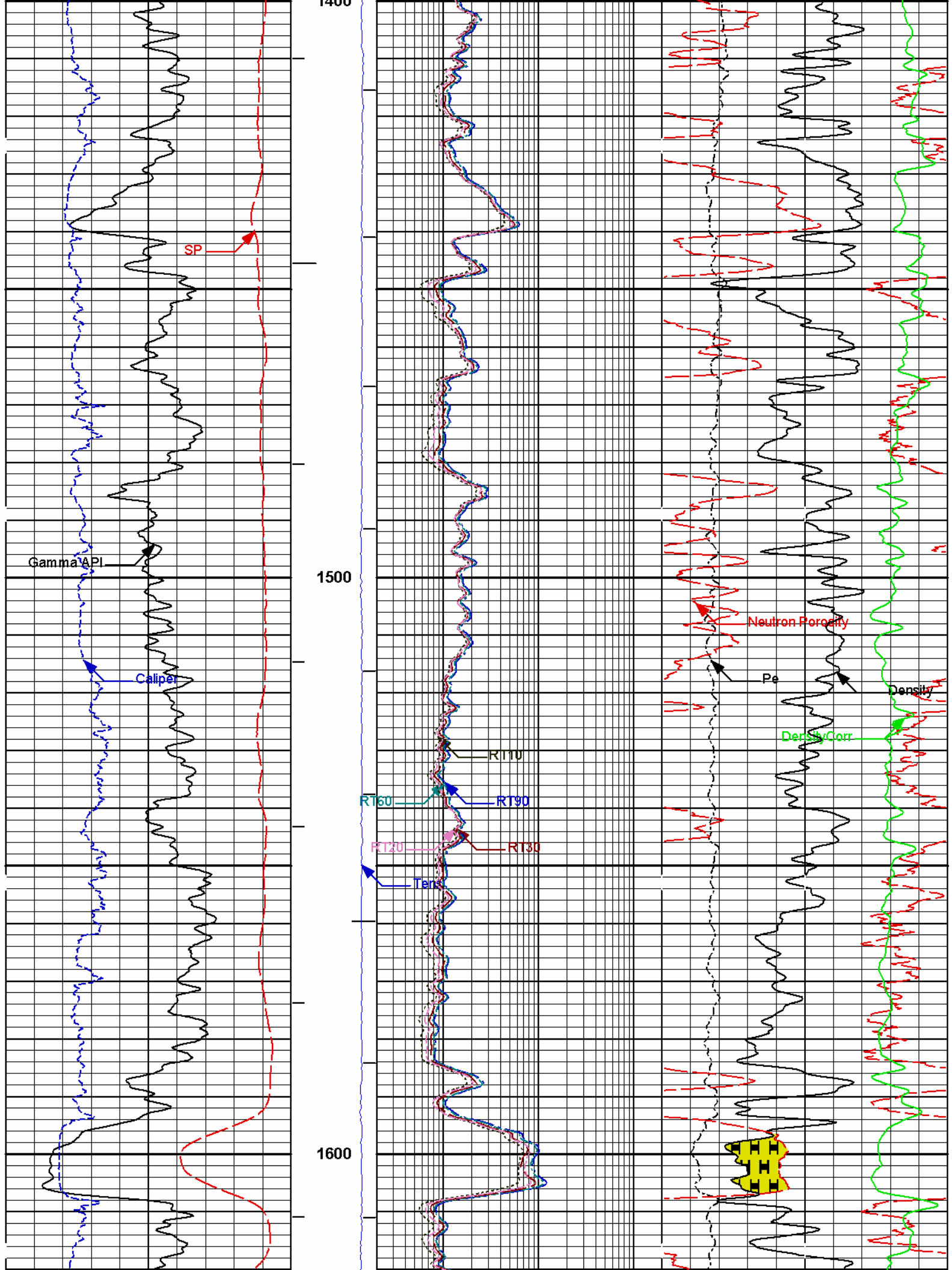
Plot Time: 12-Sep-08 16:31:41  
Plot Range: 950 ft to 7316 ft  
Data: FED\_SMITH\_21\_12\Well Based\MAIN  
Plot File: \\TRIPLE\ENCANA\_IQ\_TRIPLE\_M

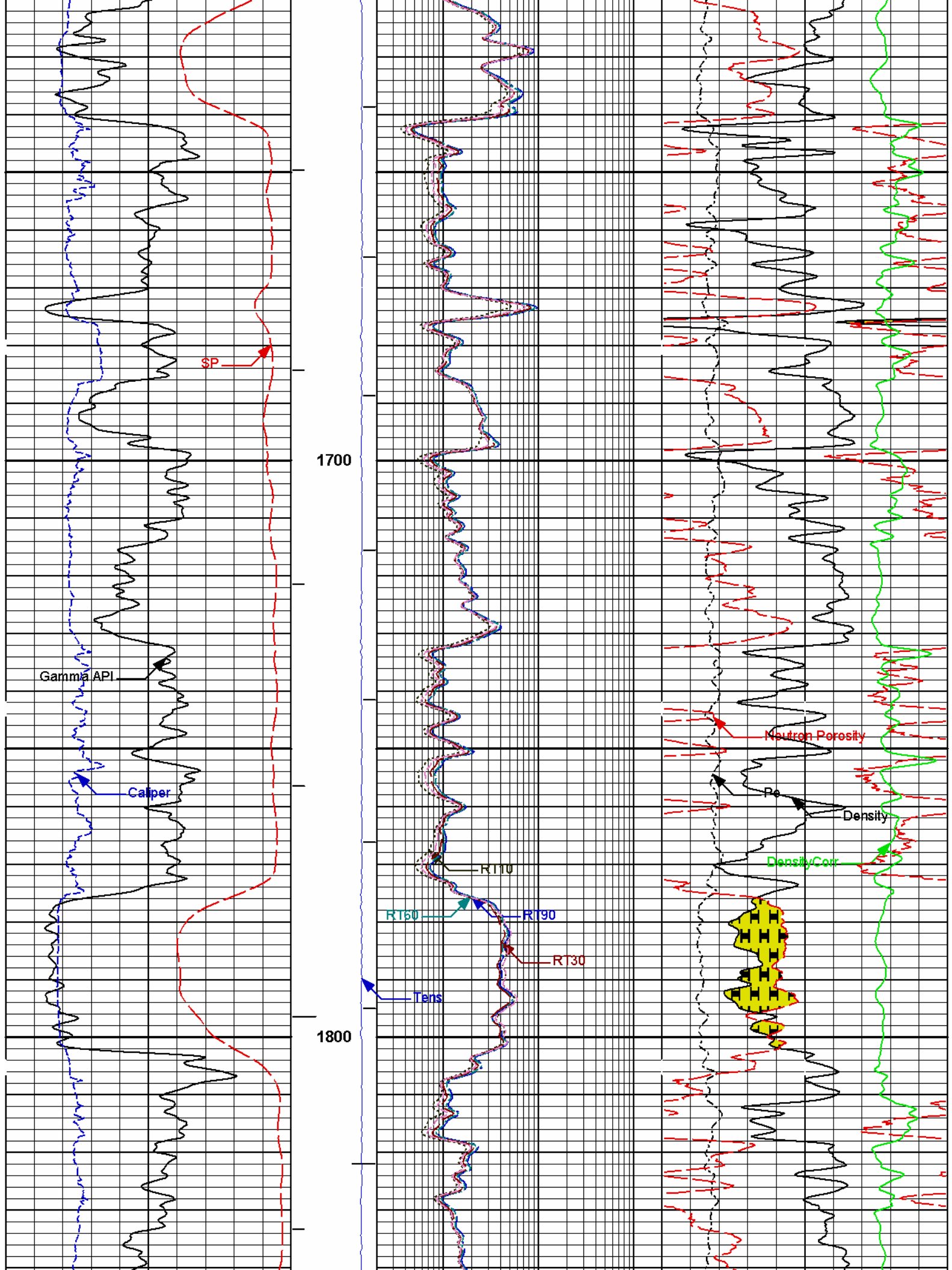
**MAIN PASS 5" = 100'**

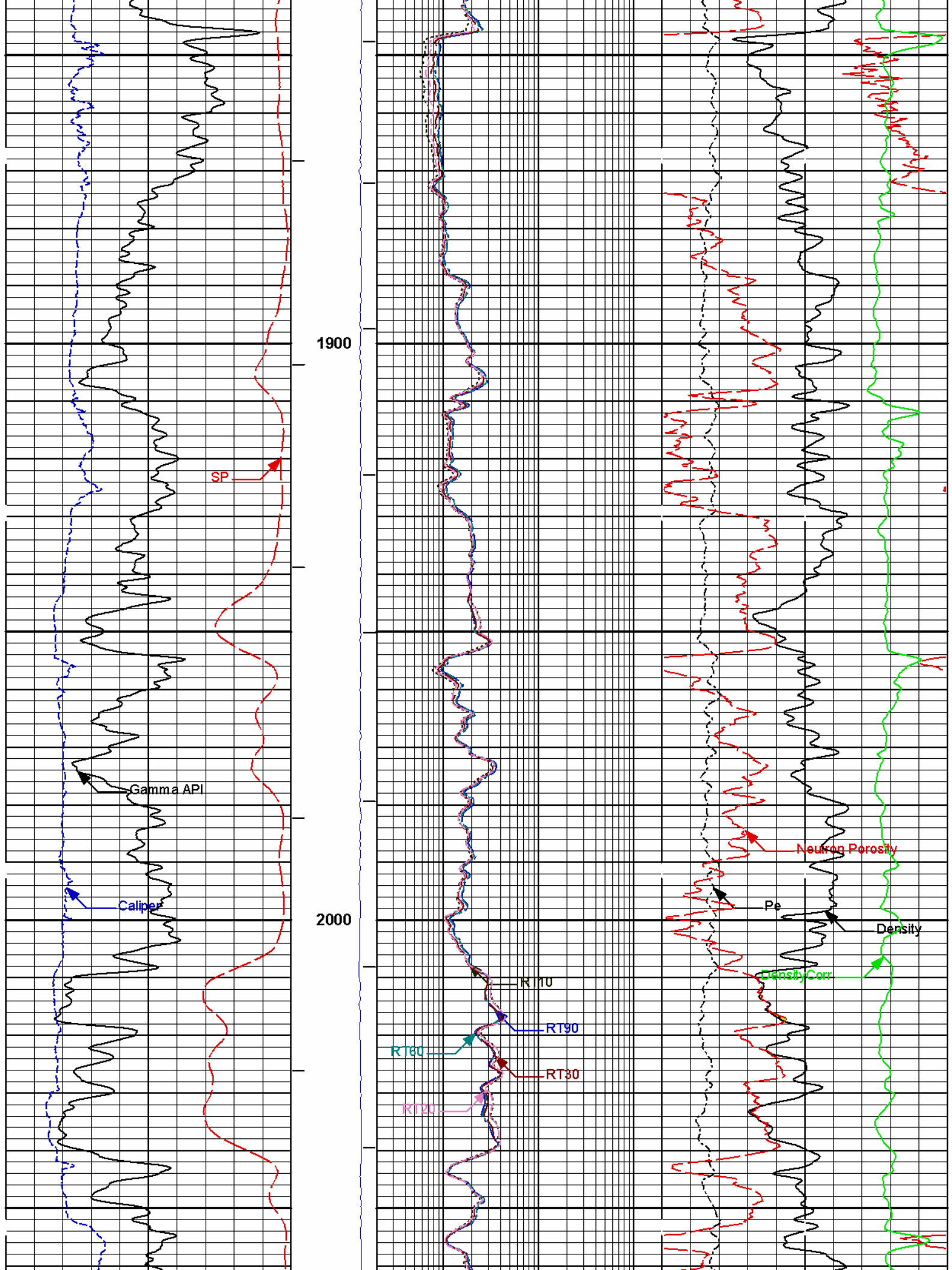


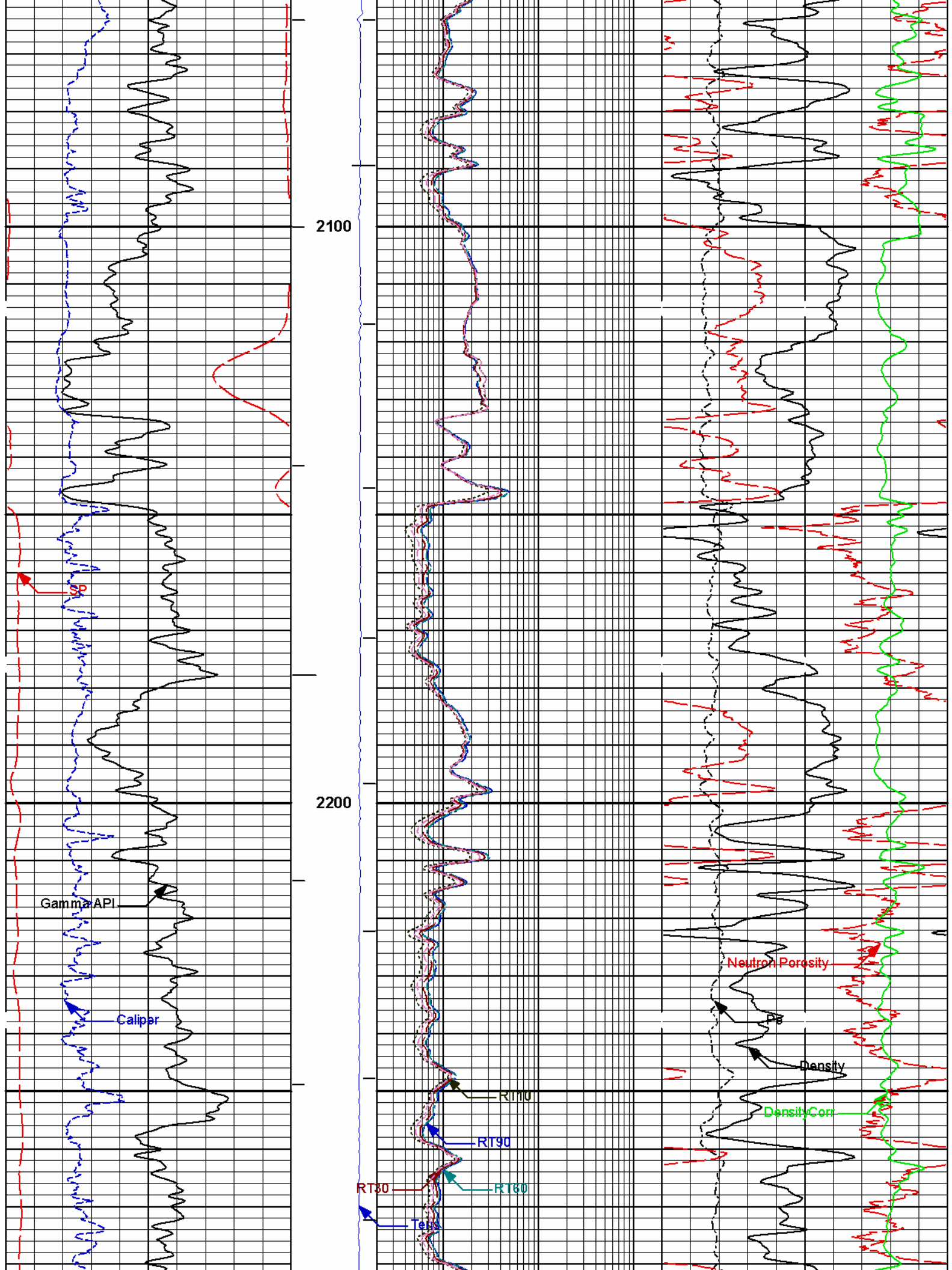


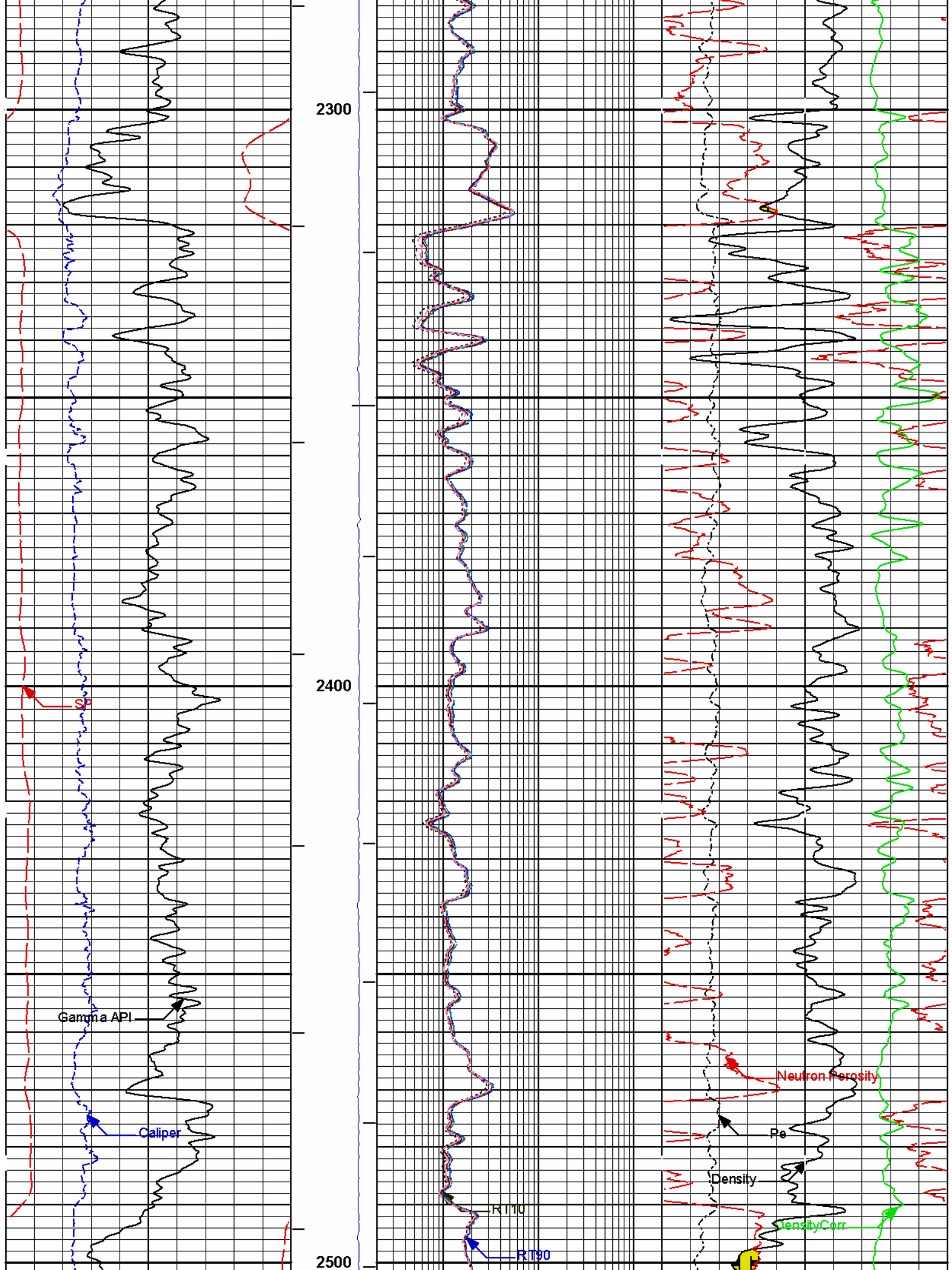


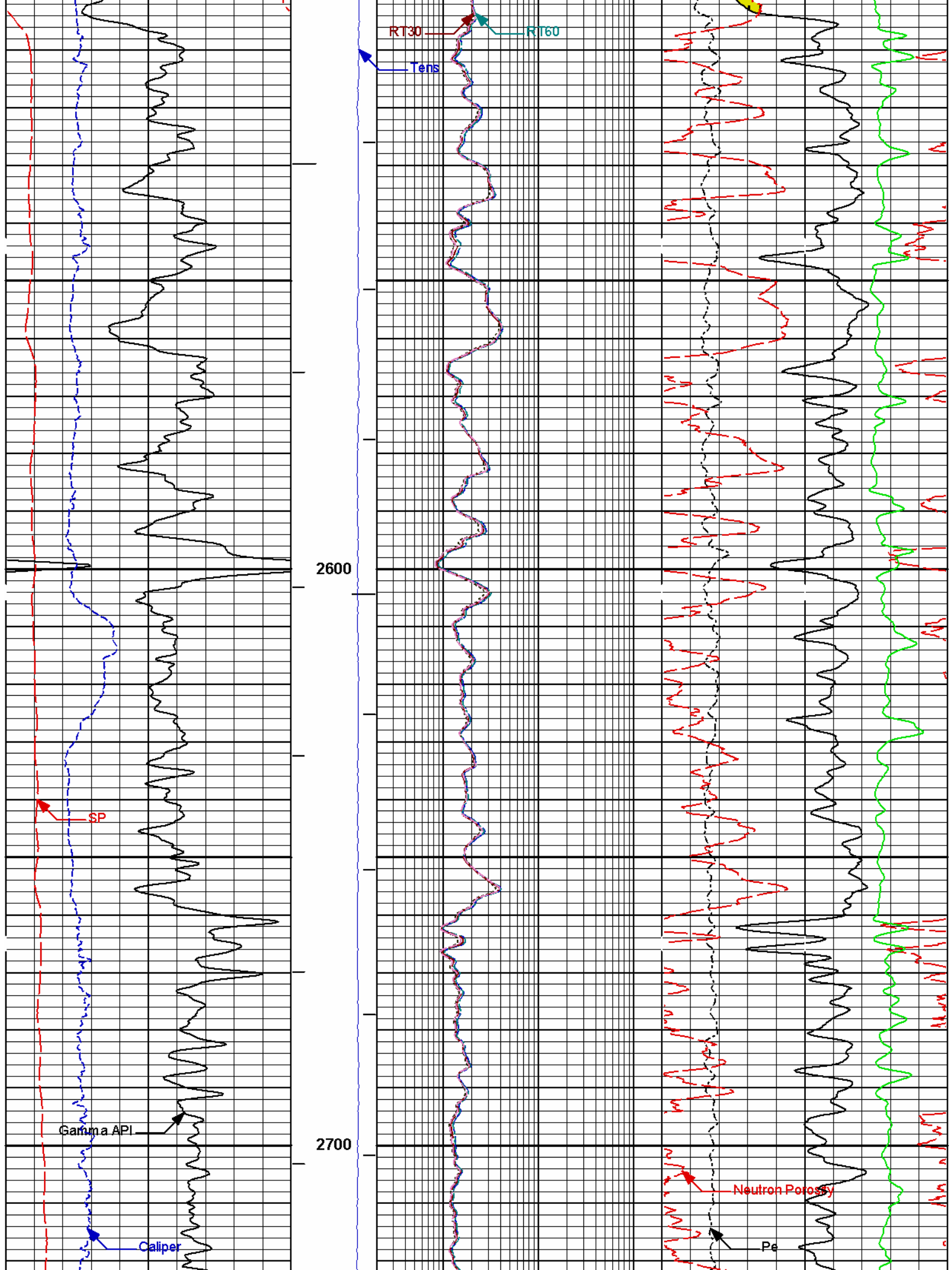


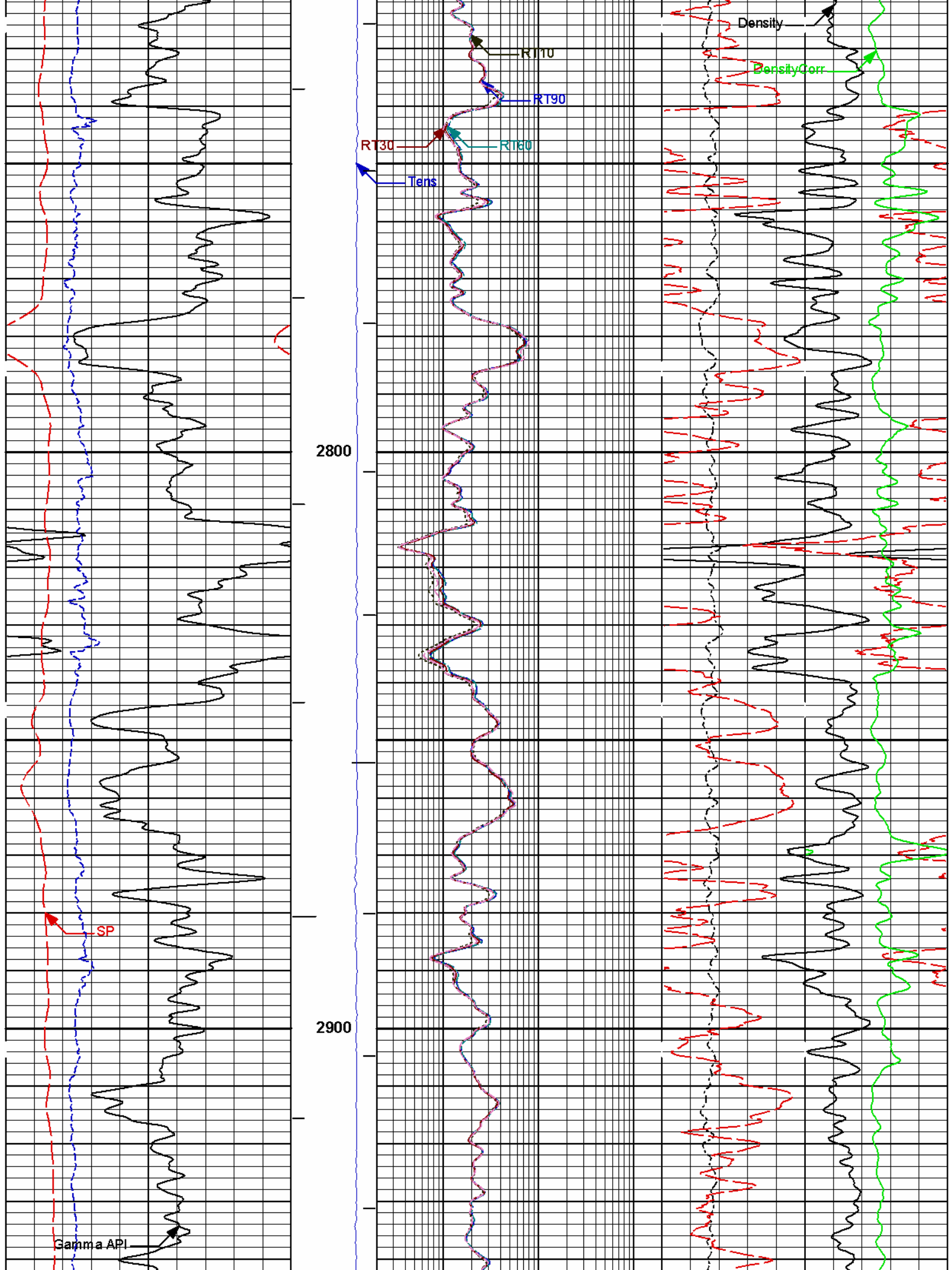


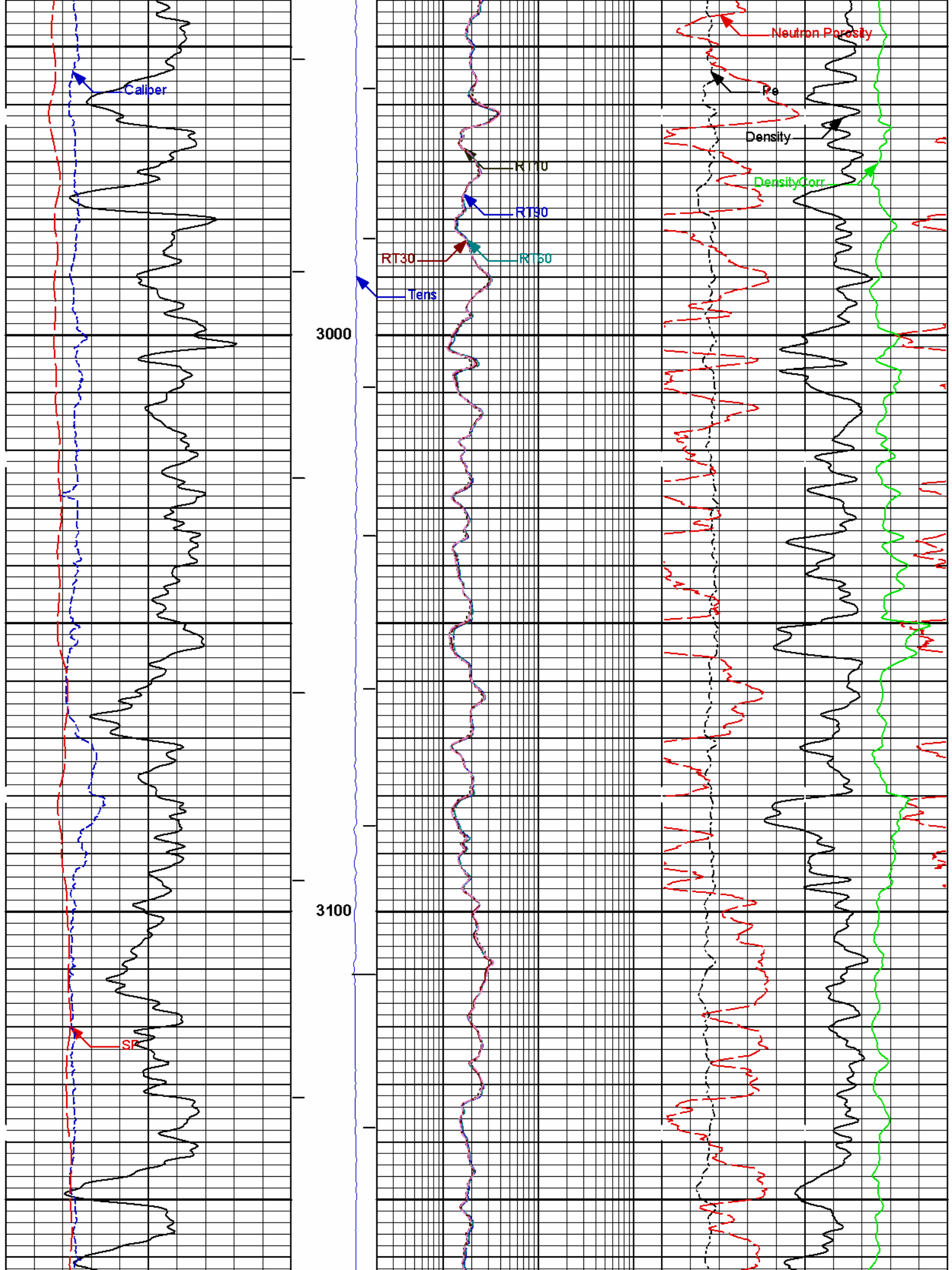


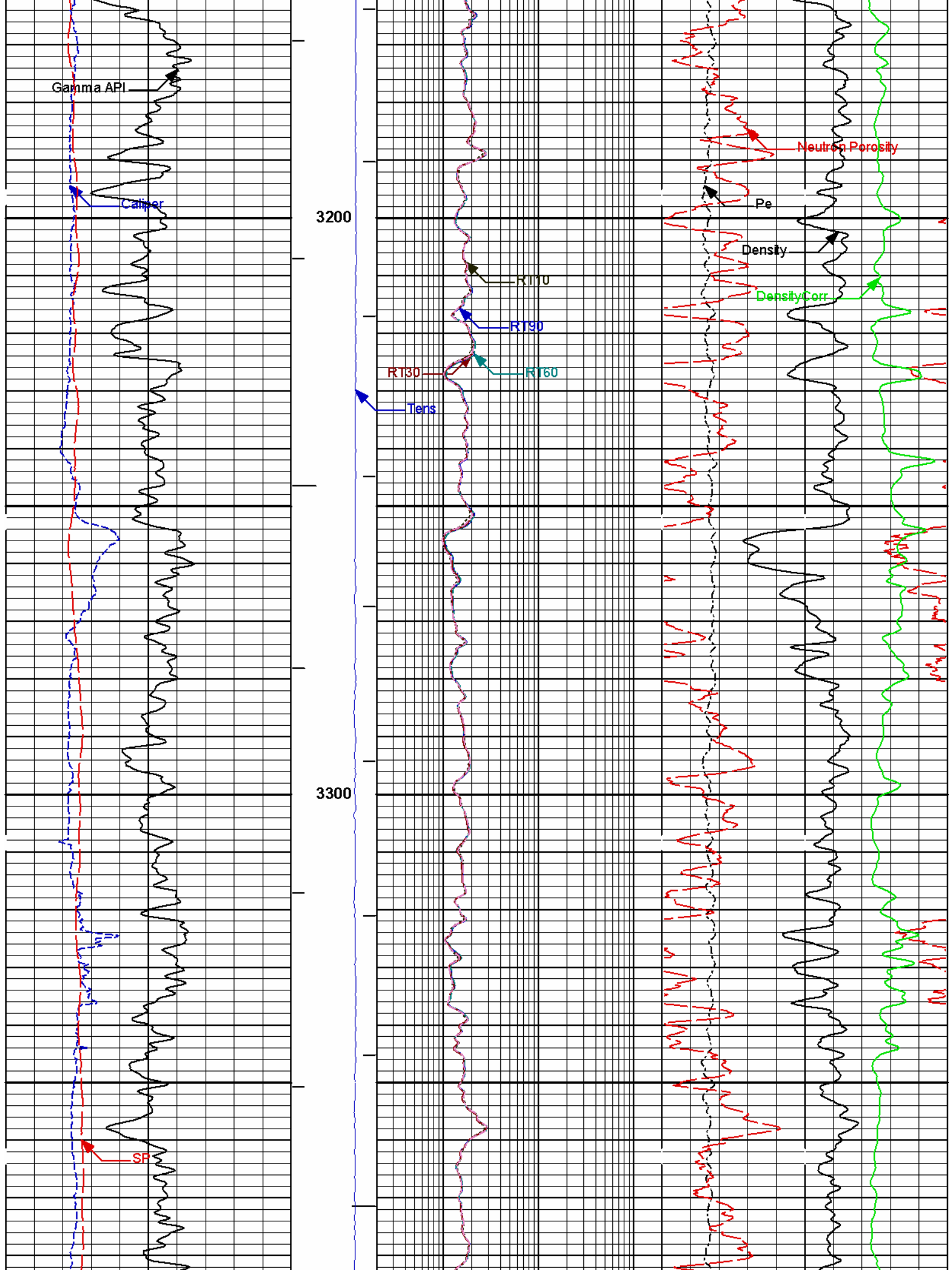


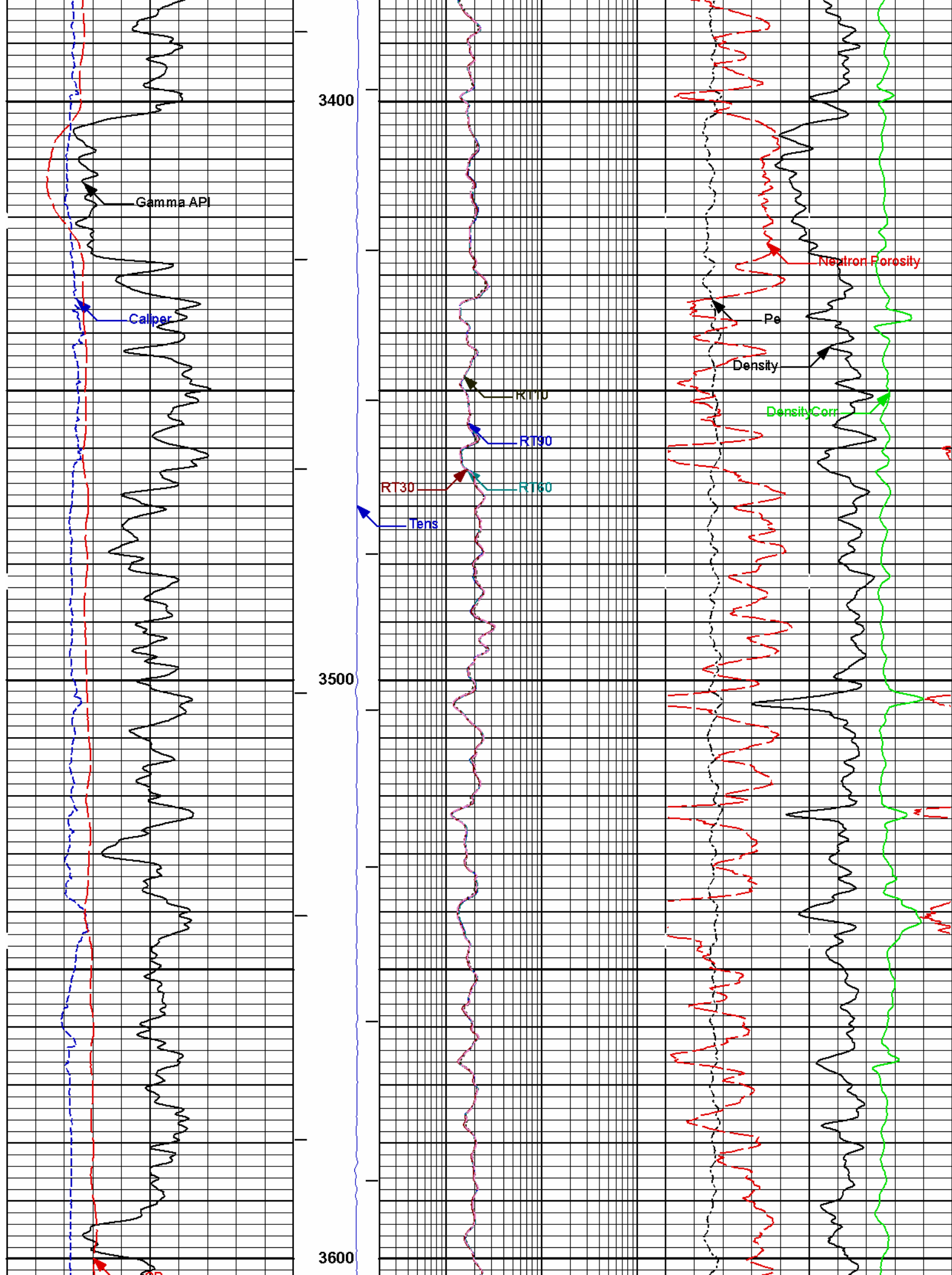


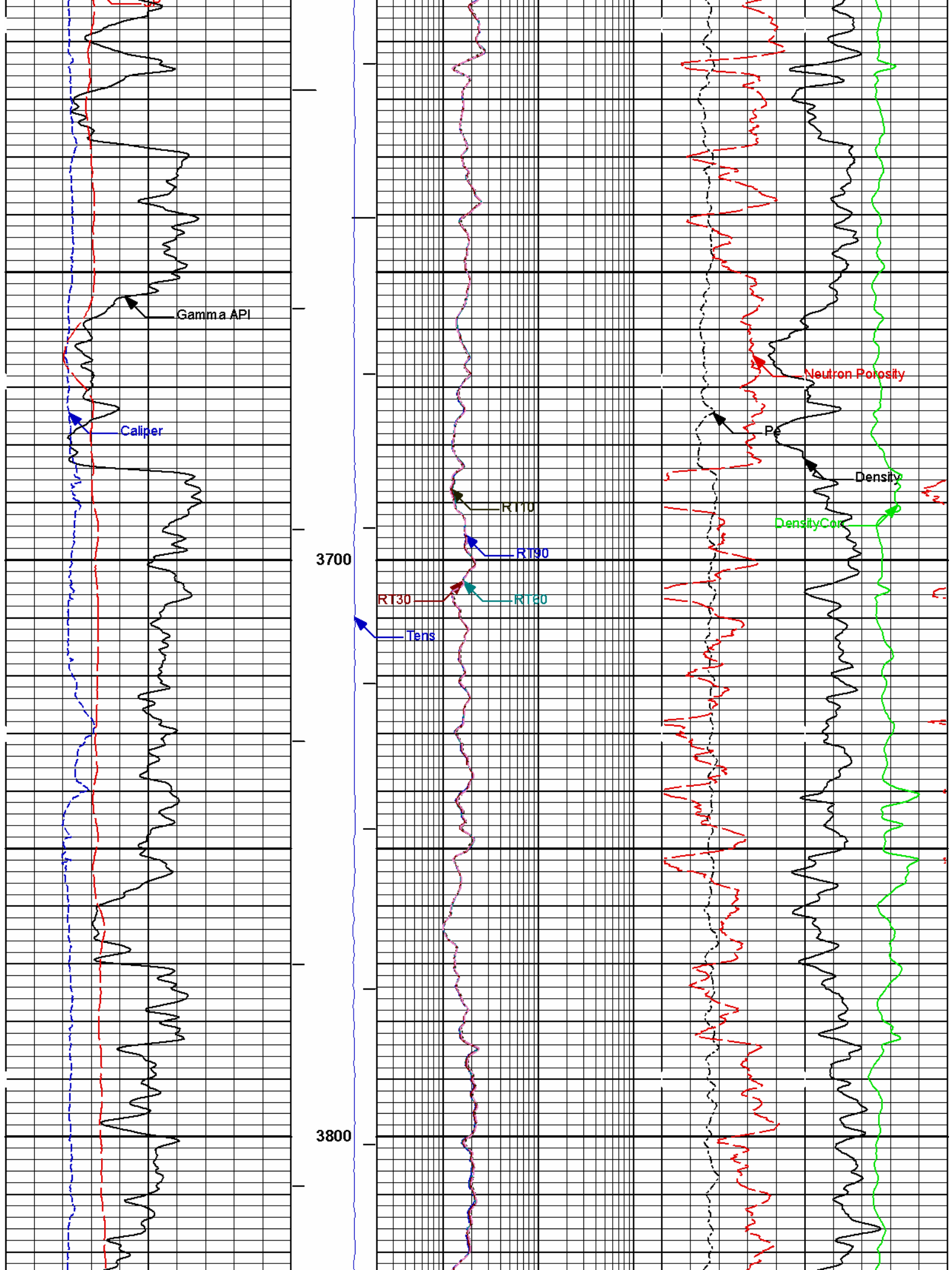


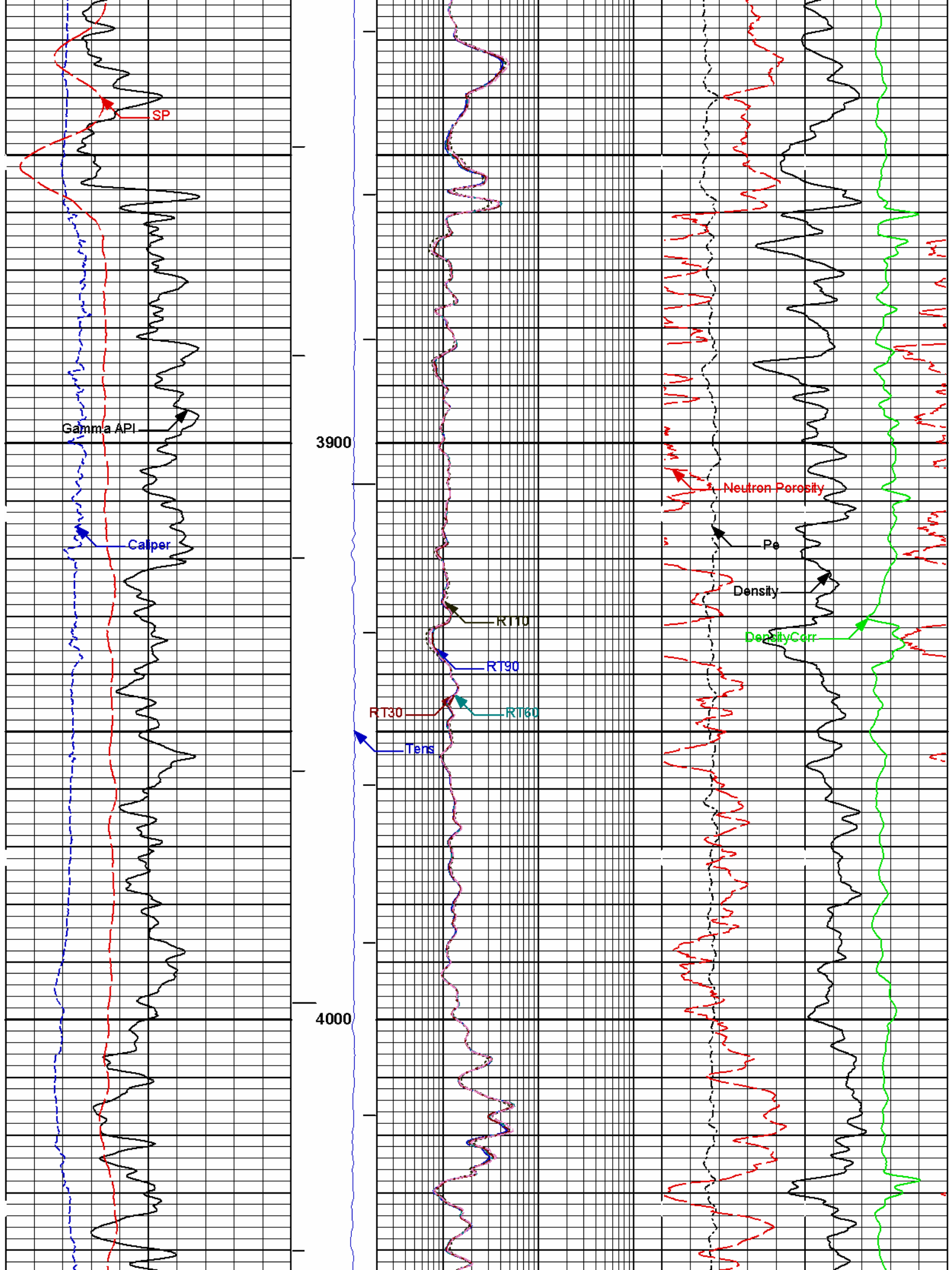


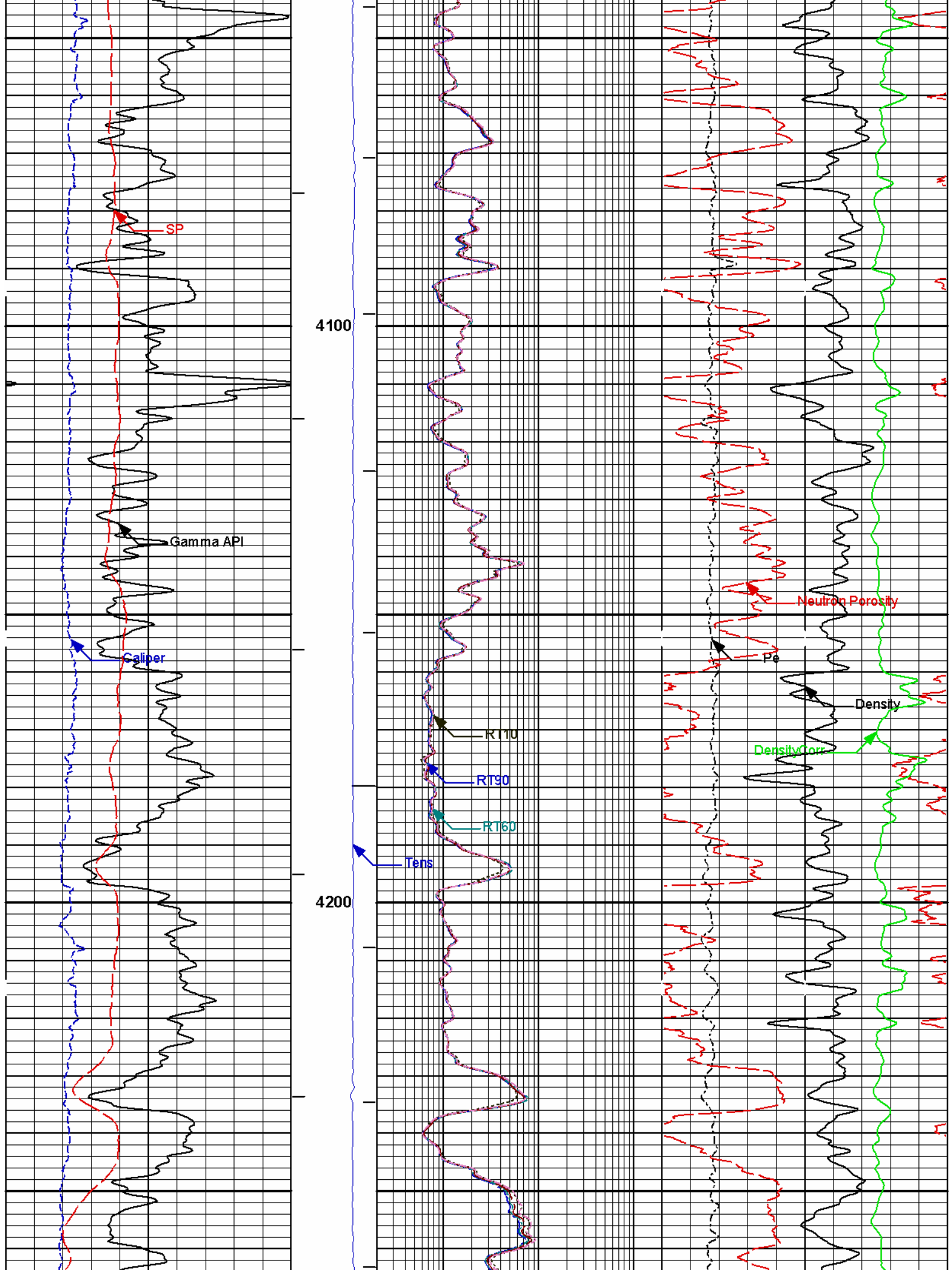


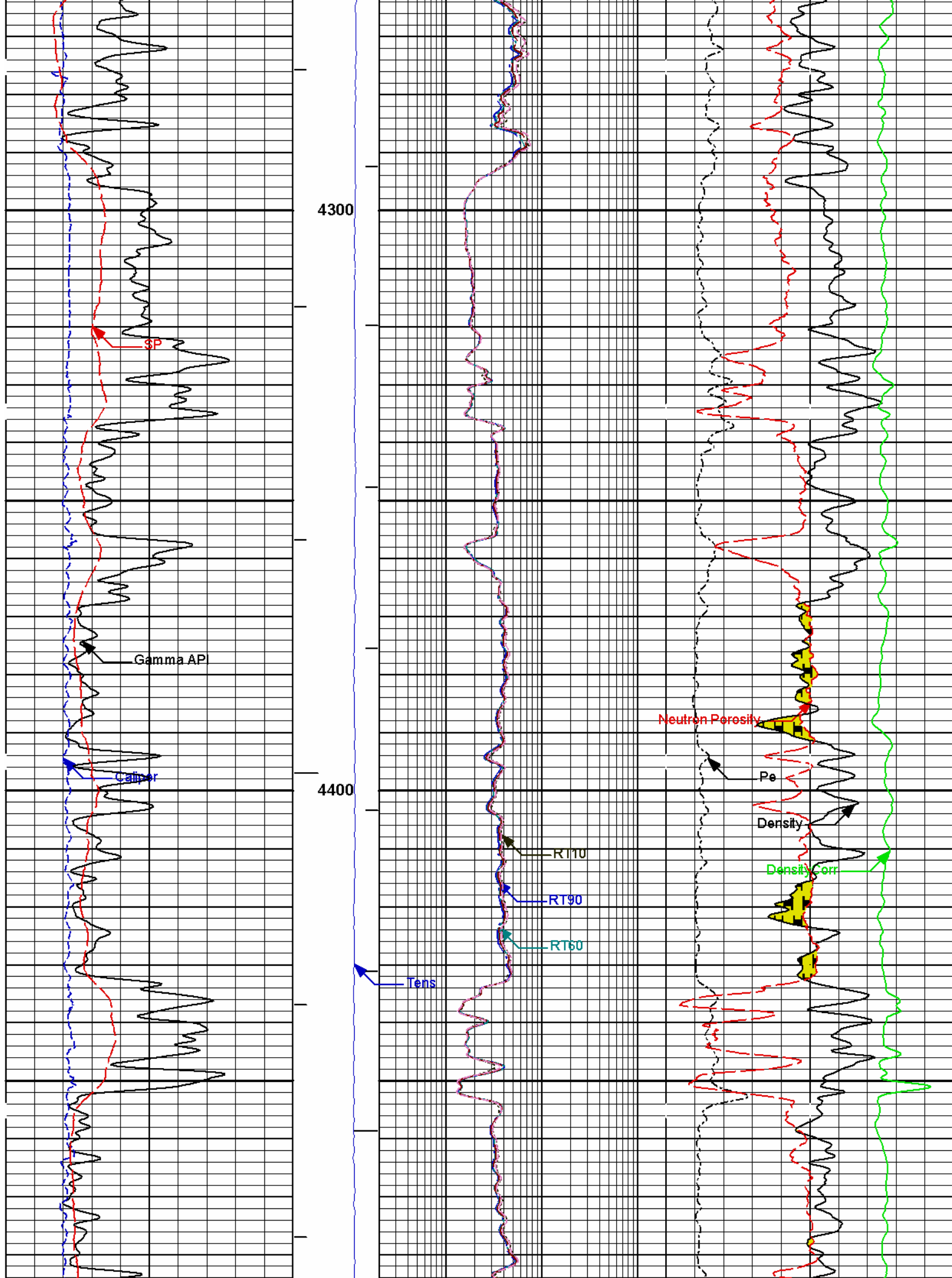


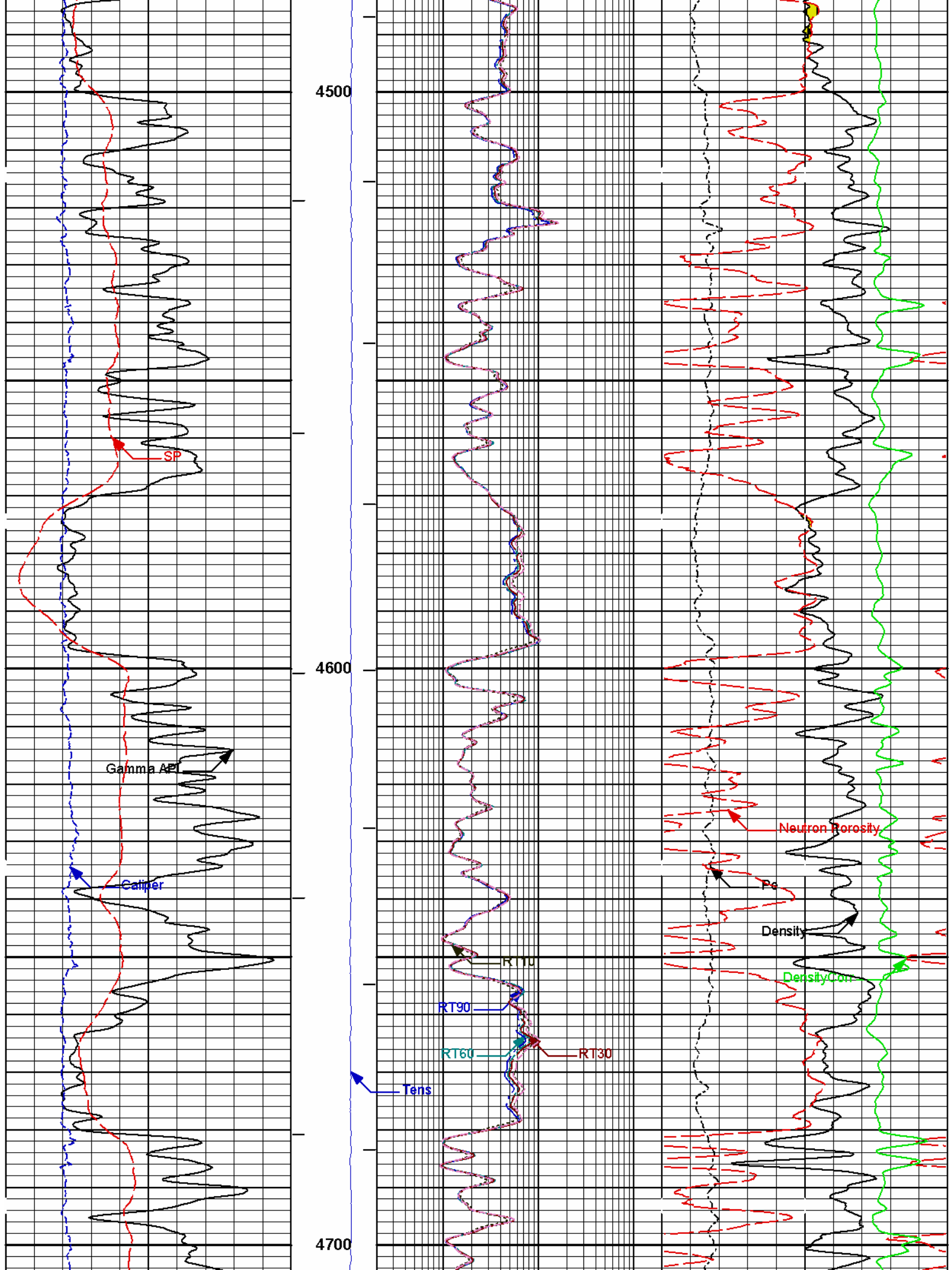


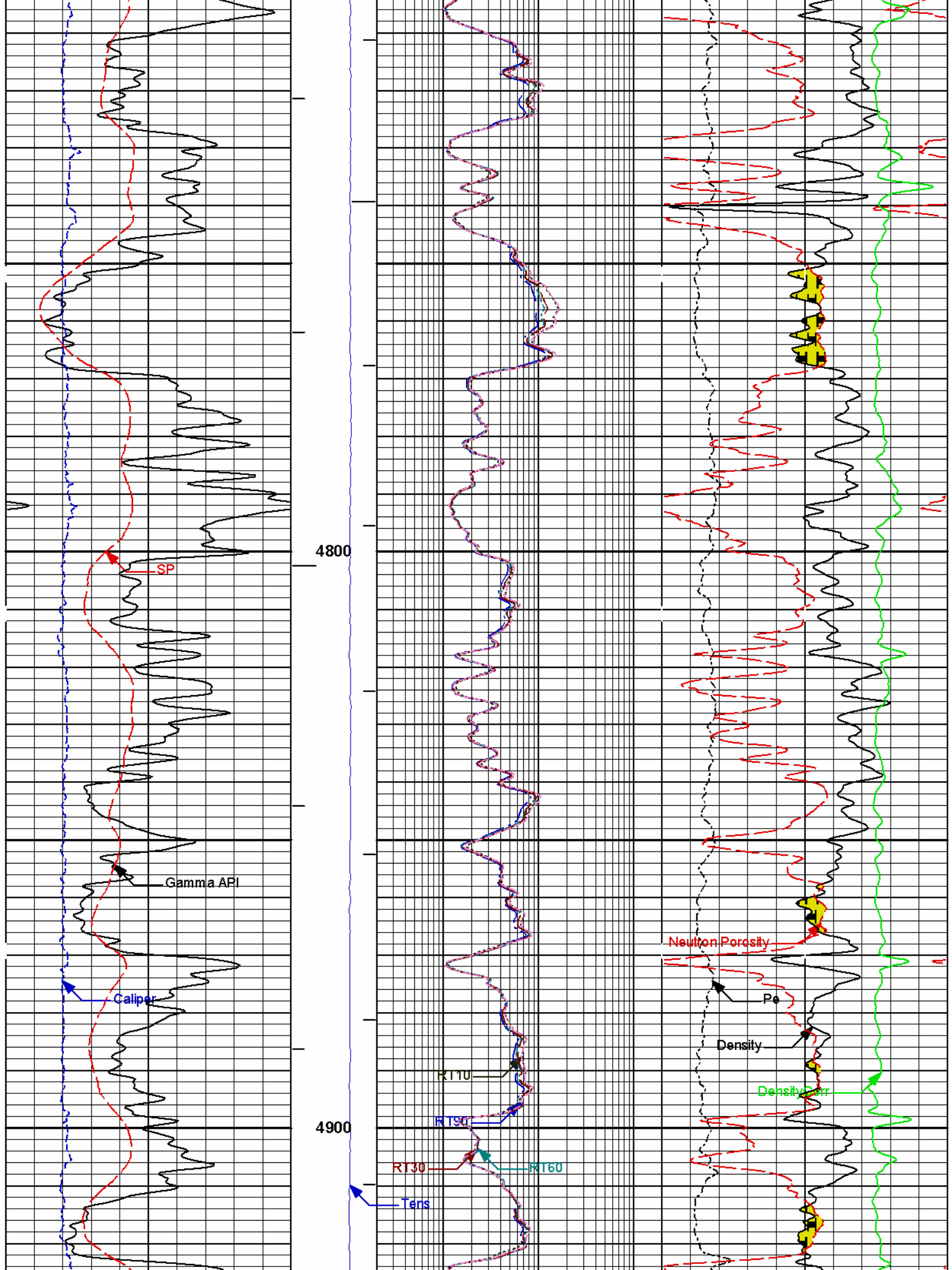


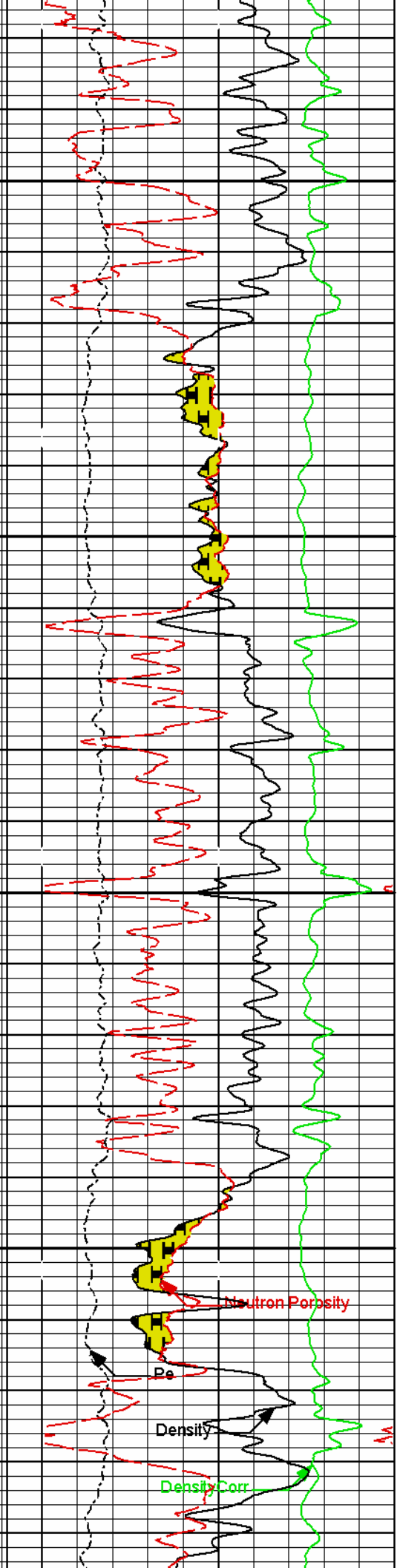
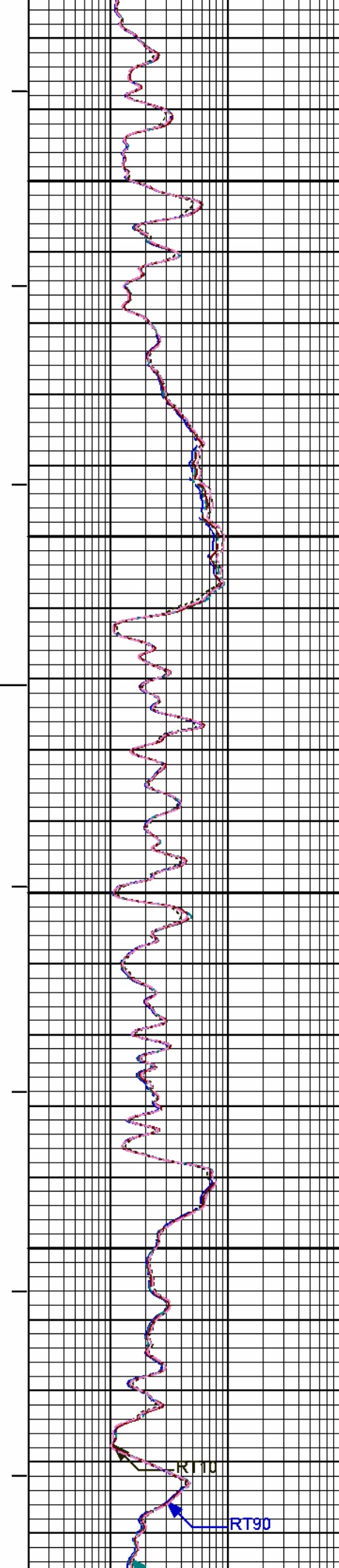
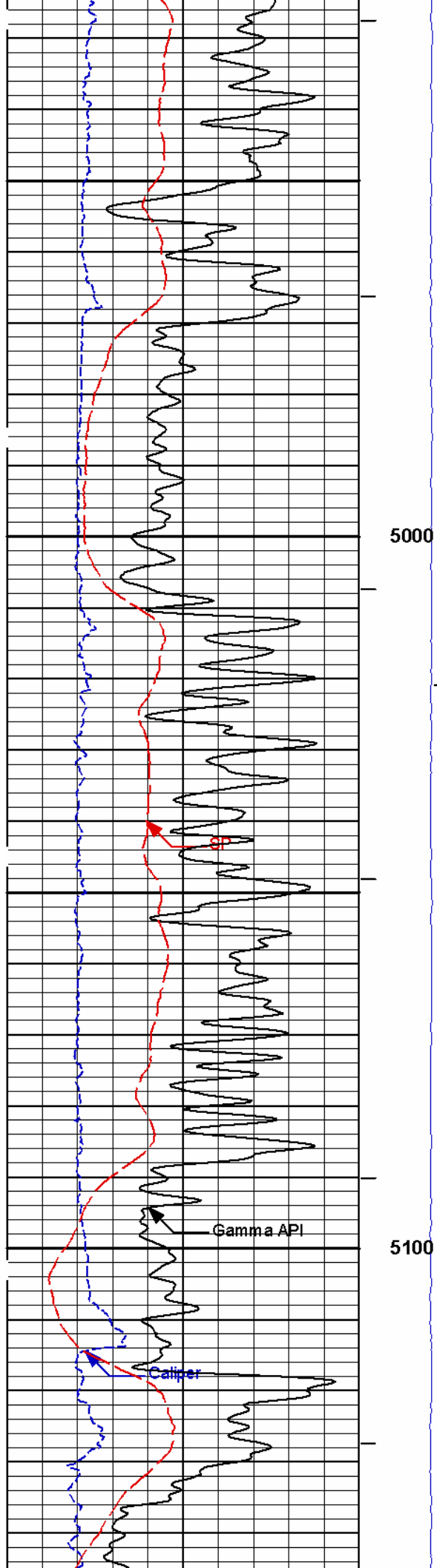


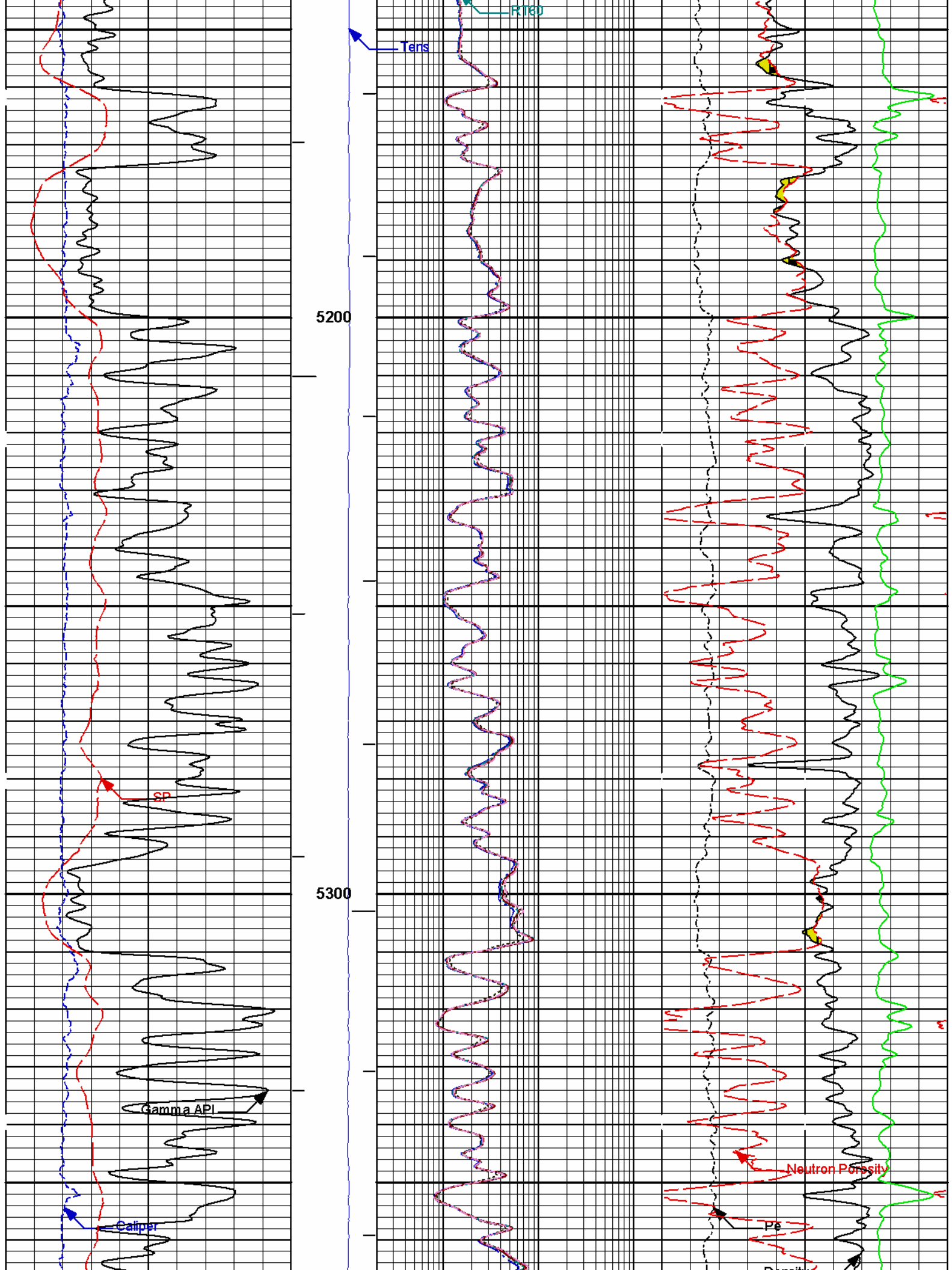


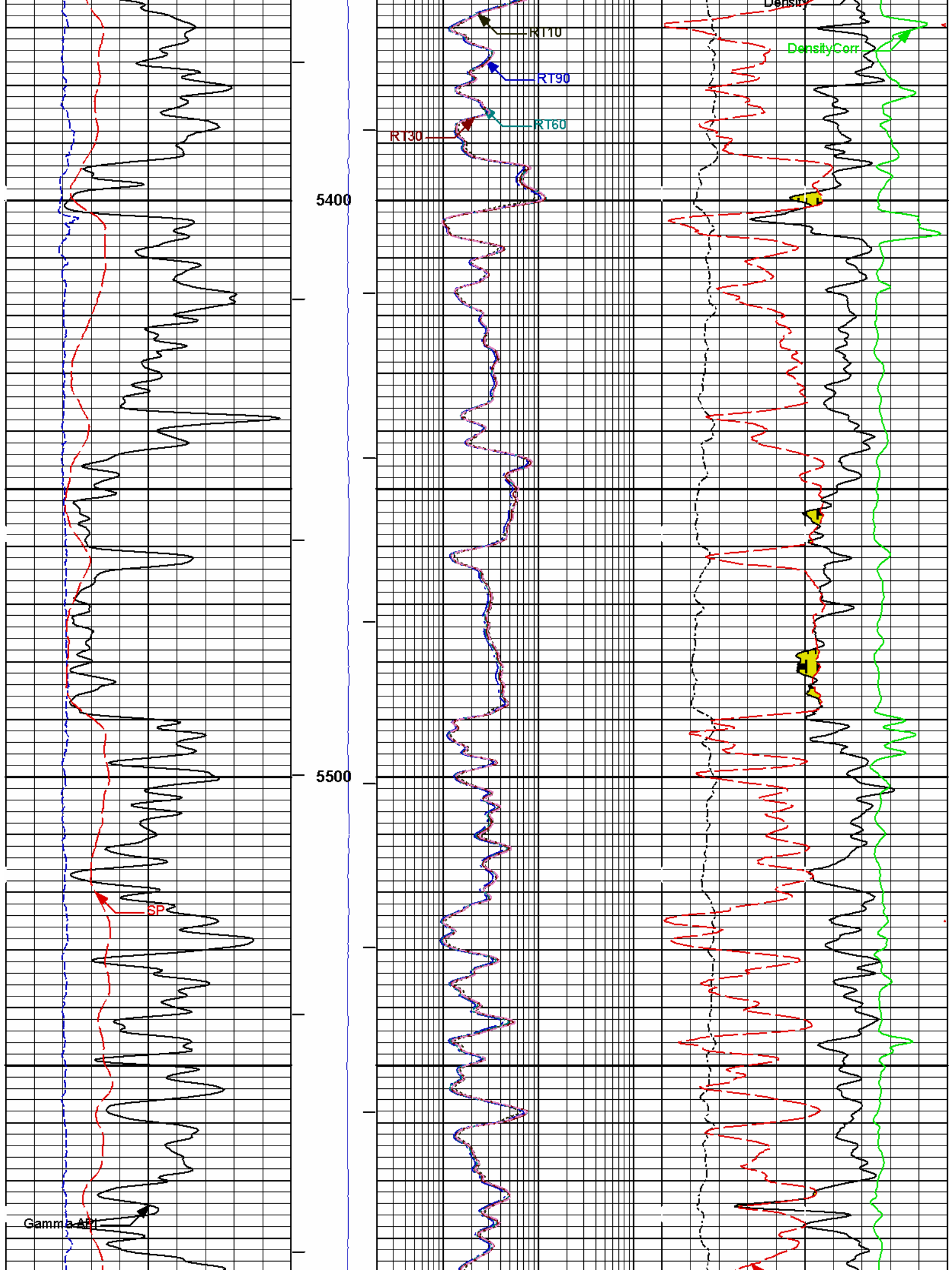


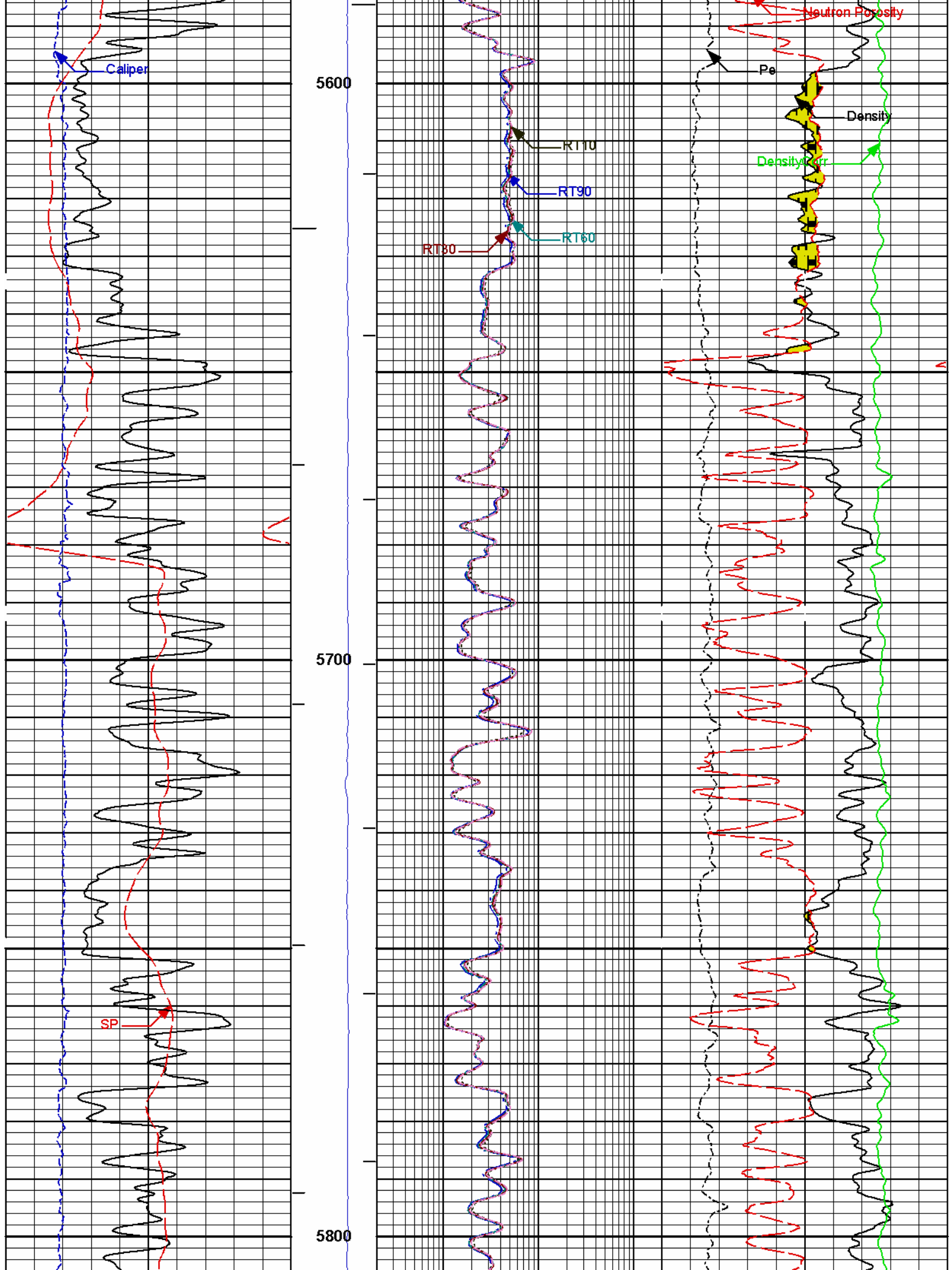


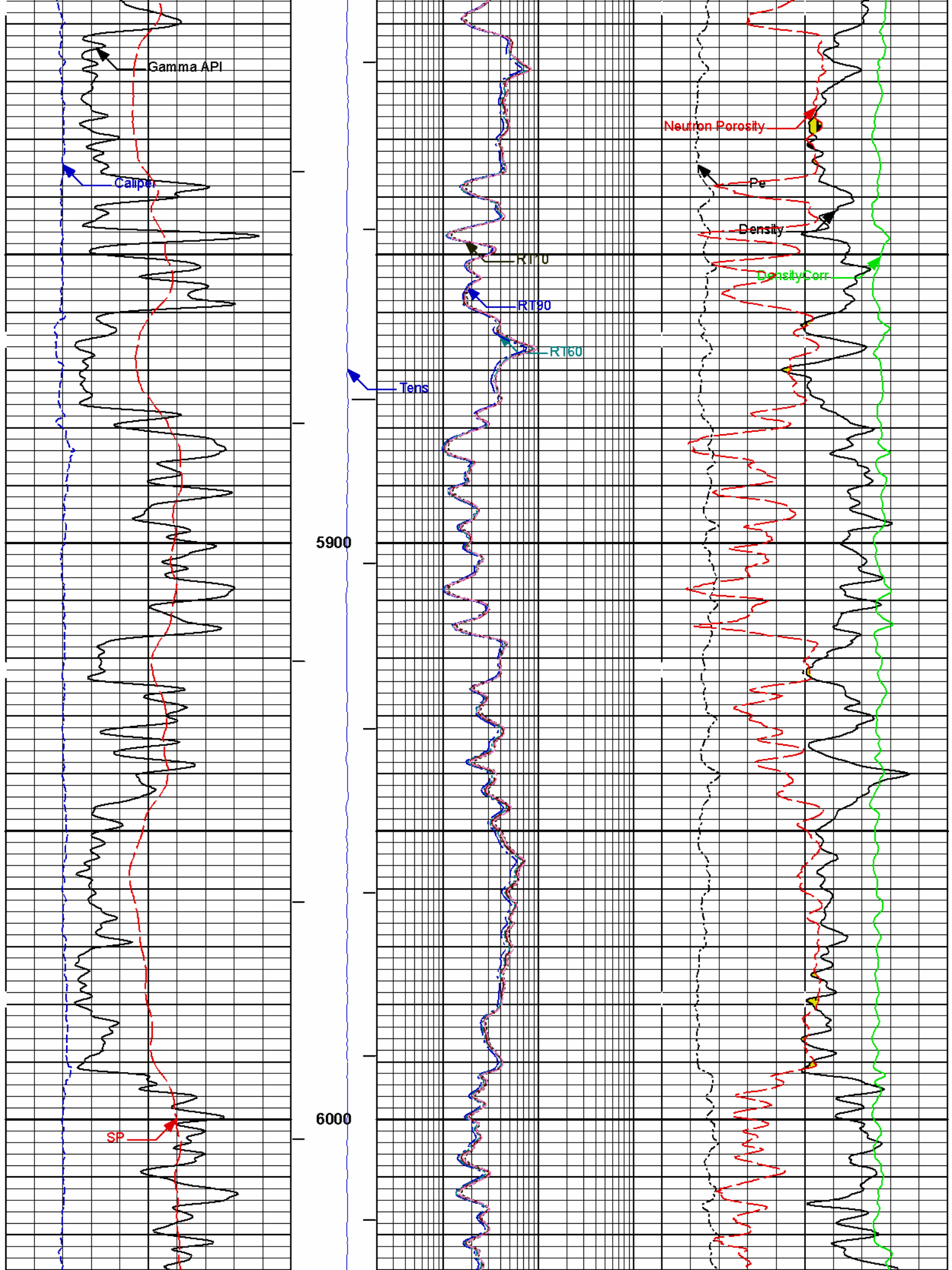


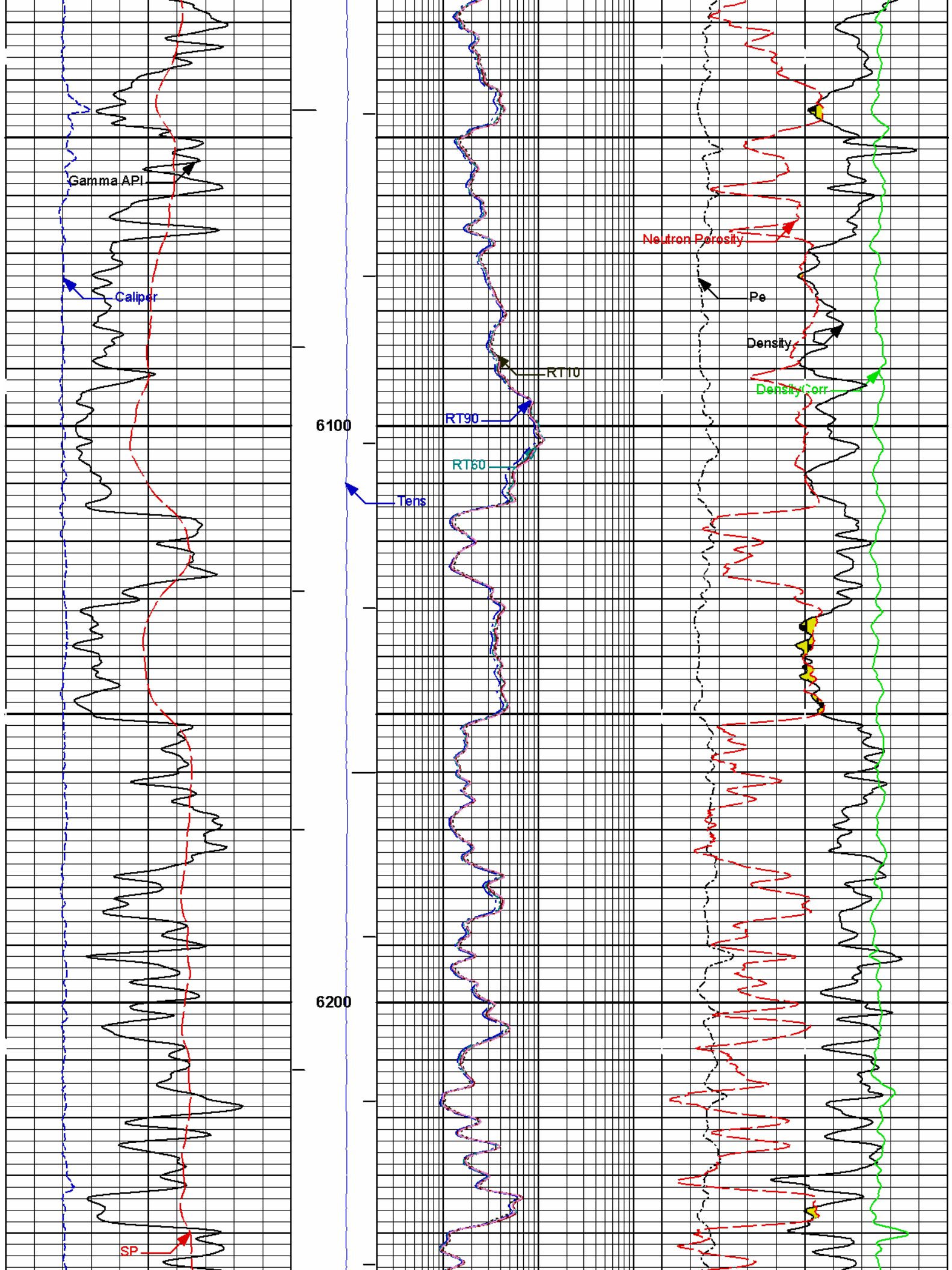


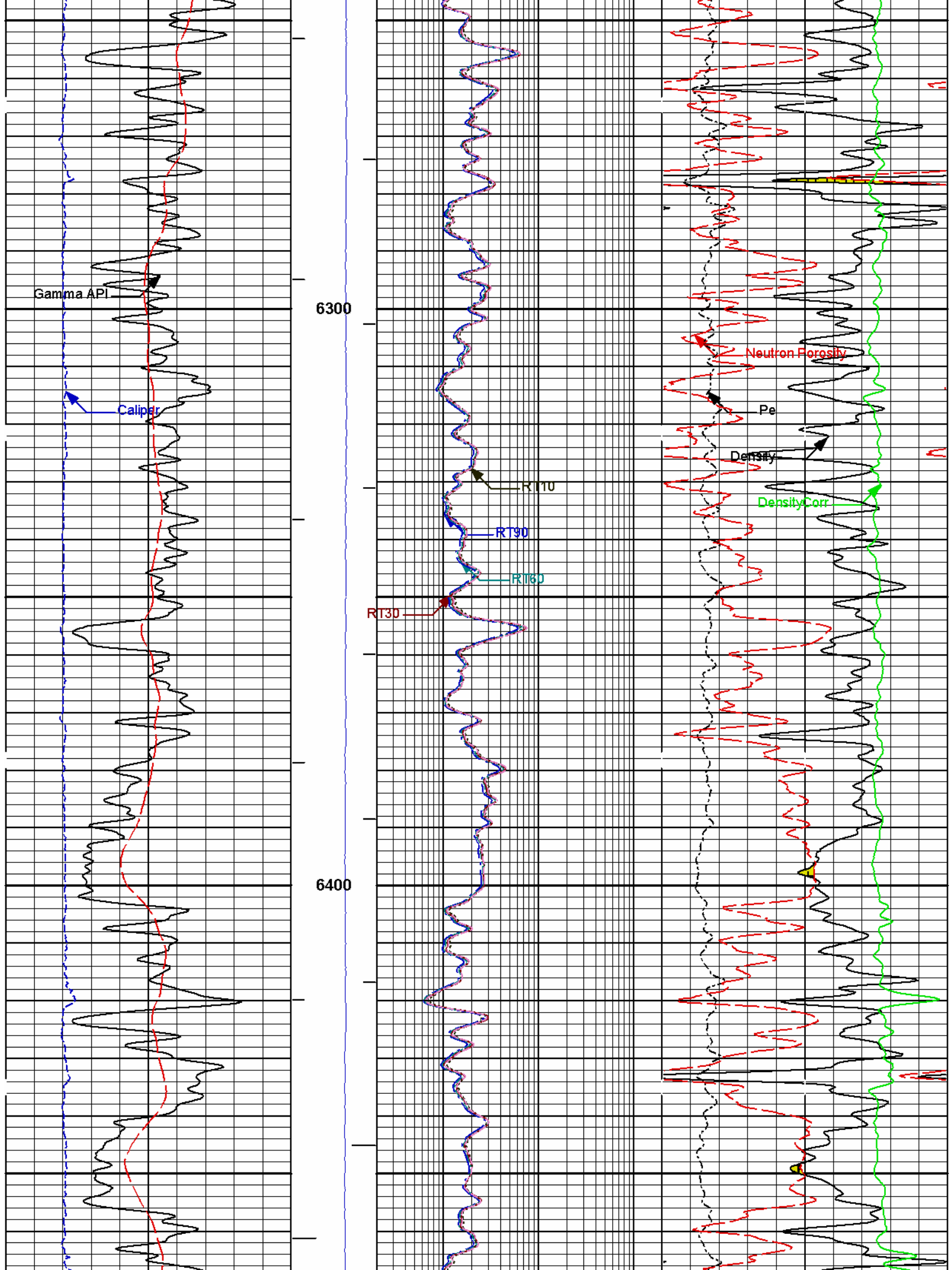


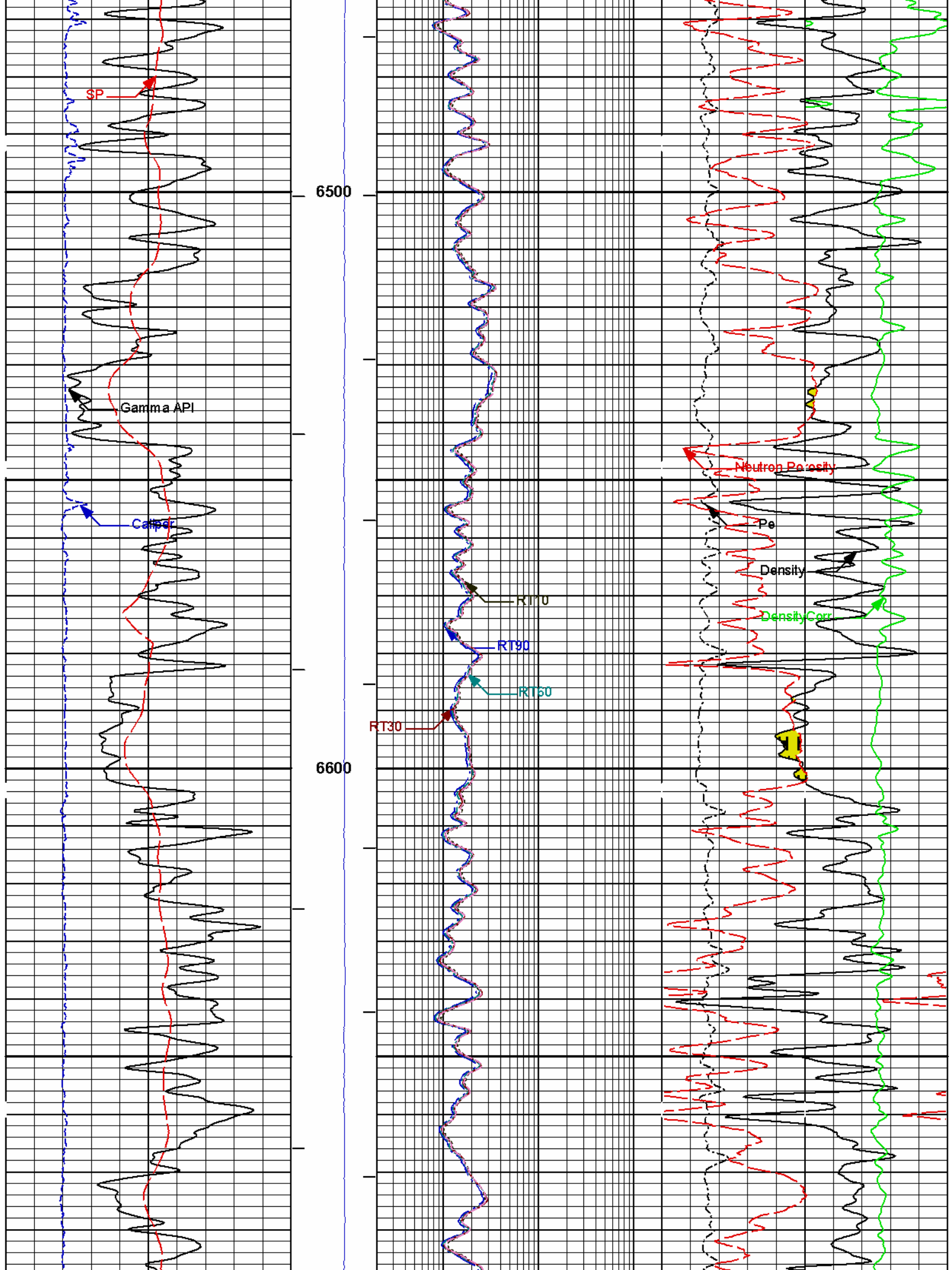


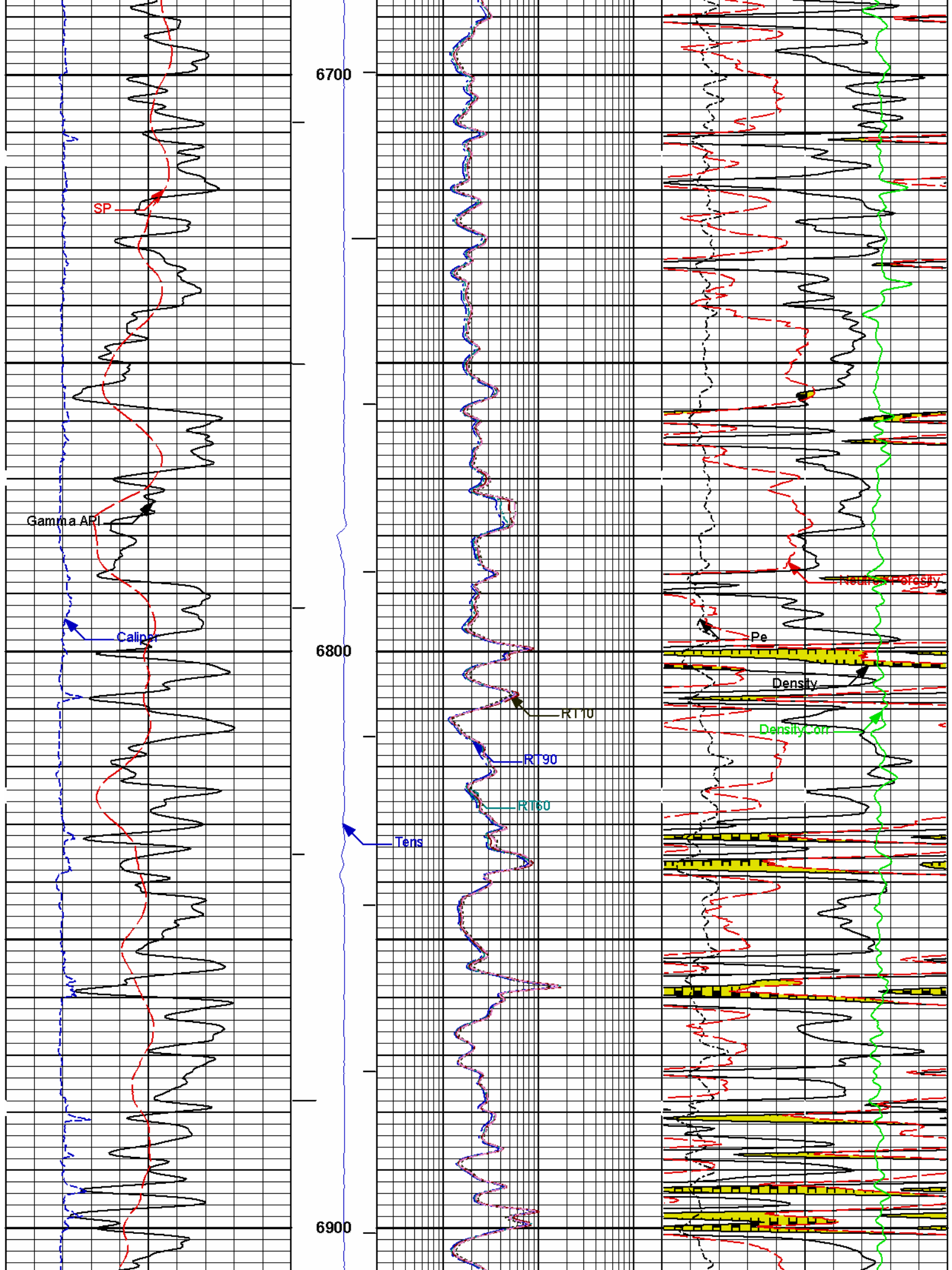


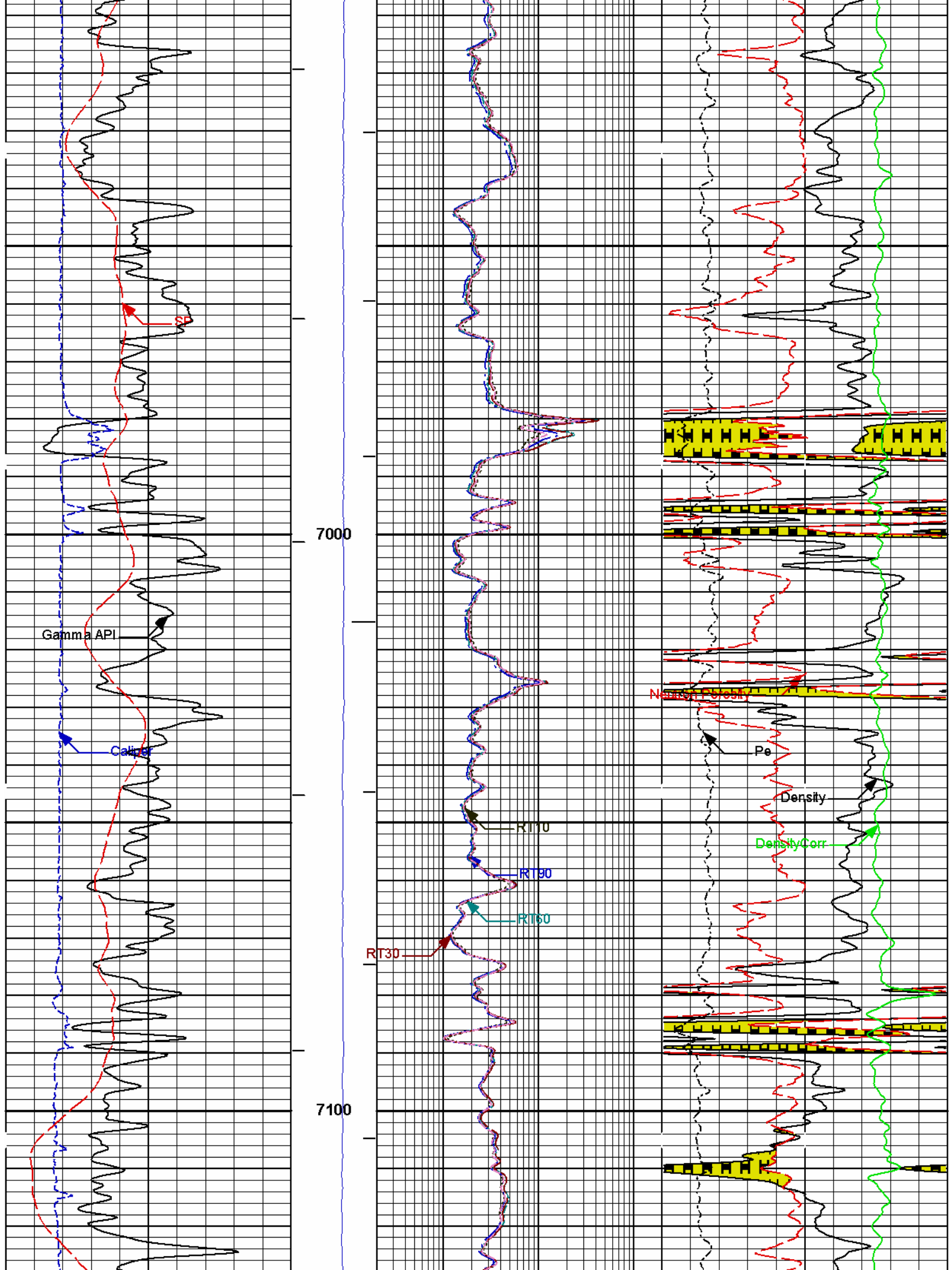


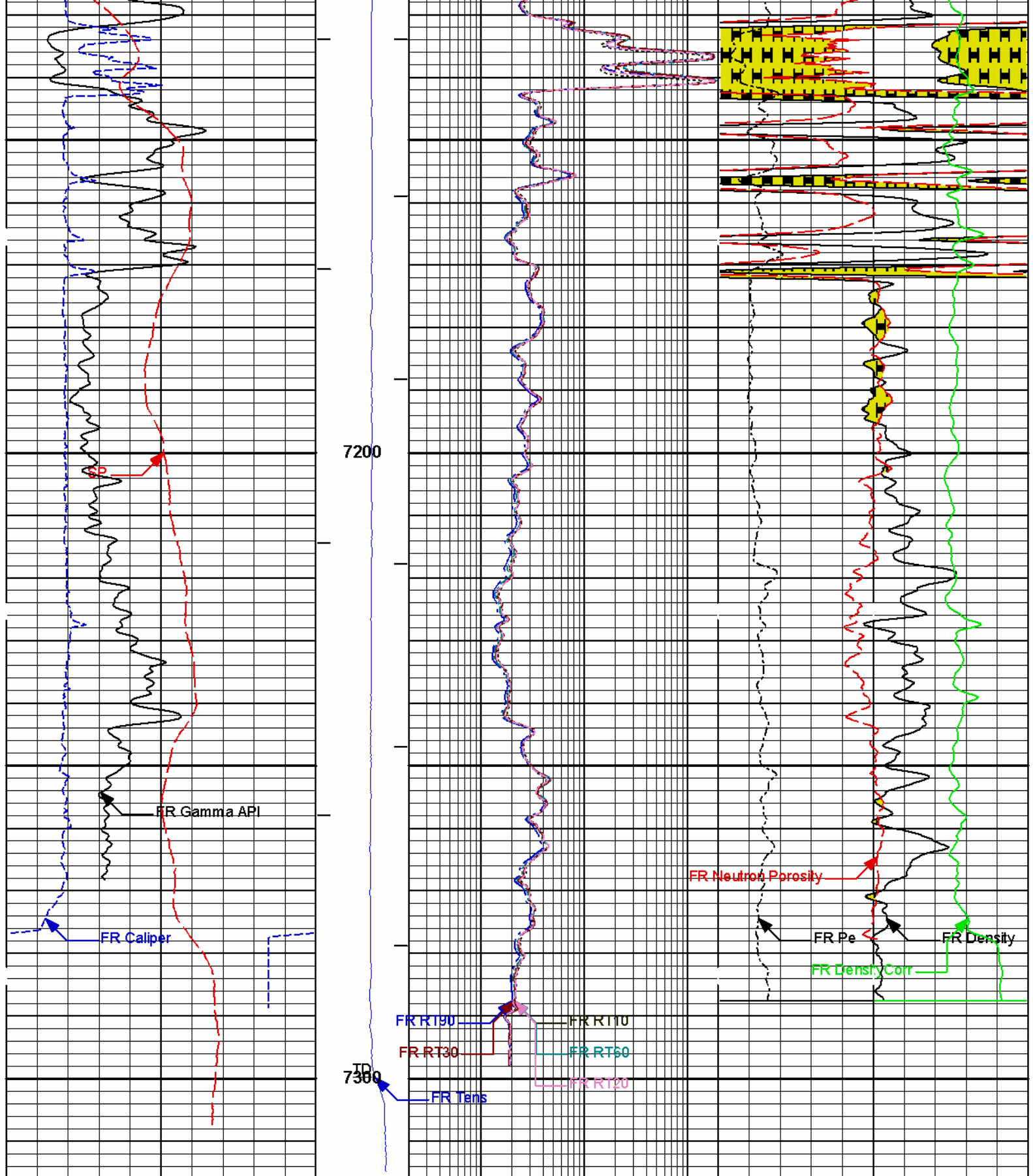












0	Gamma API	200	BHVT	2	RT90	2K	0	Pe	10	-0.25 DensityCorr 0.25
	api				Ohm-m					gram per cc
6	Caliper	16	AHVT	2	RT60	2K	30	Neutron Porosity	-10	
	inches				Ohm-m			percent		
0	SP	100	10K Tens	0	RT30	2K	30	Density	-10	
	millivolts		pounds		Ohm-m			percent		

	2	RT20	2K
		Ohm-m	
	2	RT10	2K
		Ohm-m	
	2	RT06	2K
		Ohm-m	

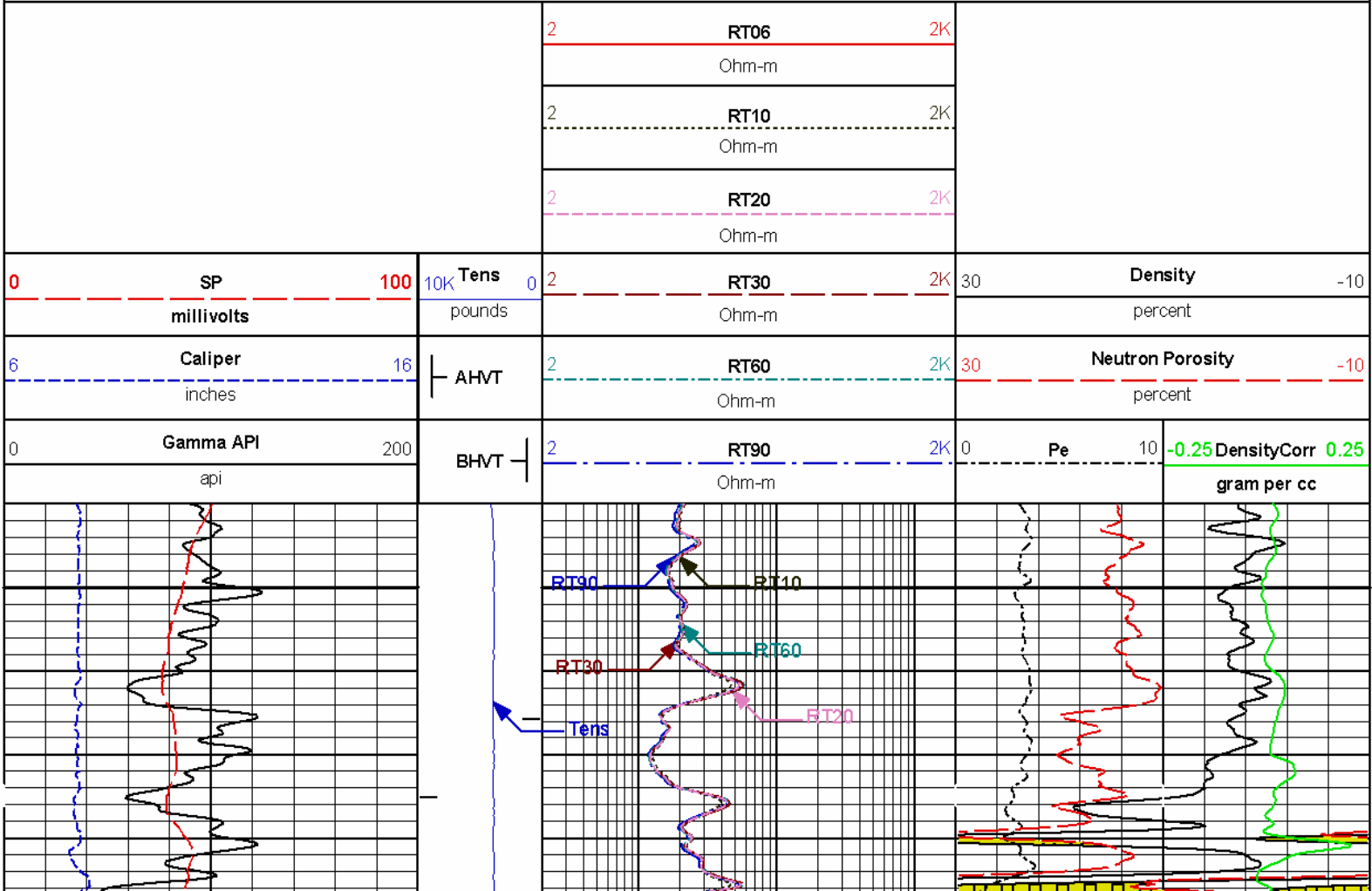
HALLIBURTON

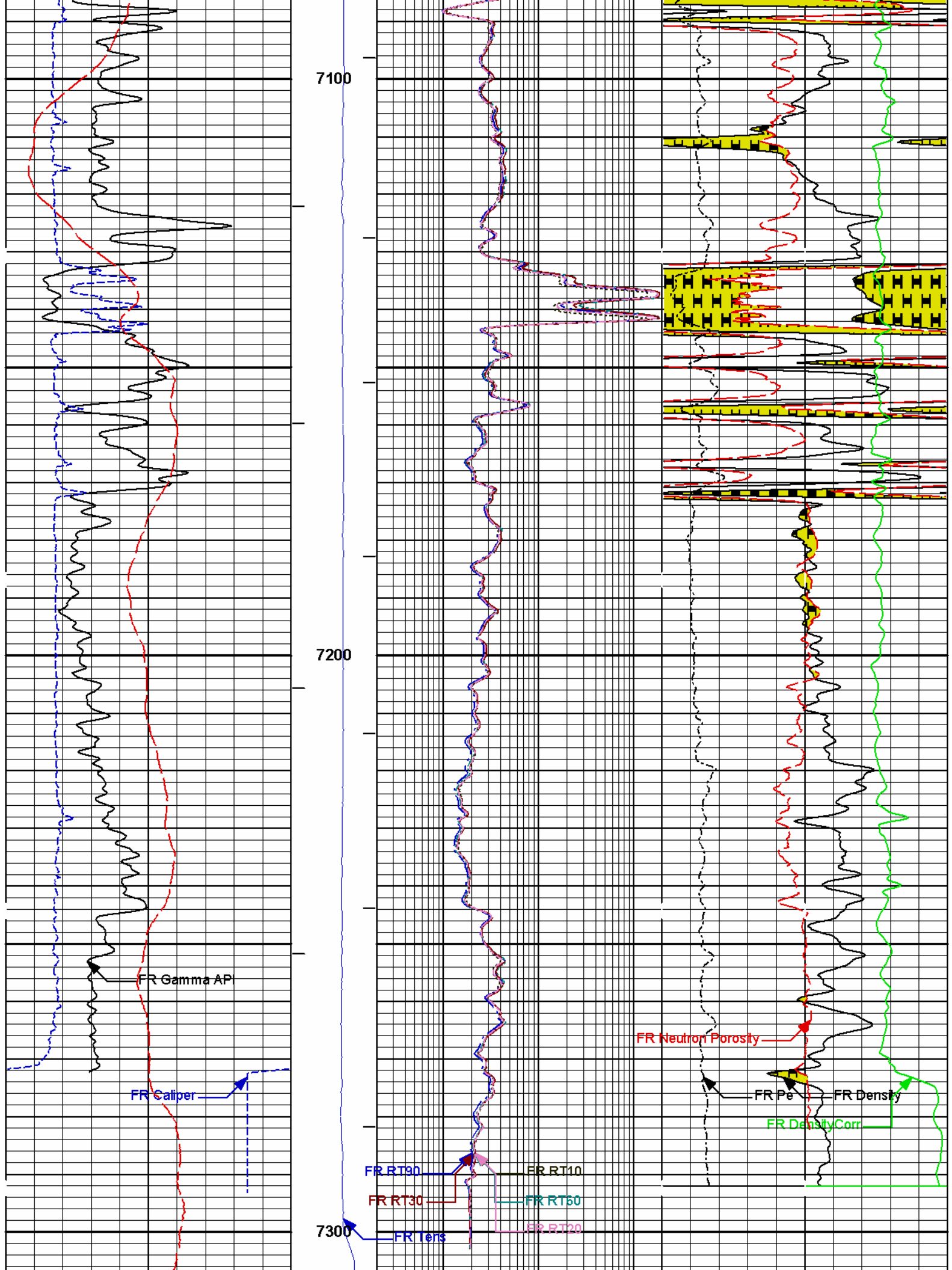
Plot Time: 12-Sep-08 16:31:51  
Plot Range: 950 ft to 7316 ft  
Data: FED\_SMITH\_21\_12\Well Based\MAIN\  
Plot File: \\TRIPLE\ENCANA\_IQ\_TRIPLE\_M

MAIN PASS 5" = 100'

HALLIBURTON		Plot Time: 12-Sep-08 16:31:51 Plot Range: 7040 ft to 7318 ft Data: FED_SMITH_21_12\Well Based\REPEAT\ Plot File: \\TRIPLE\ENCANA_IQ_TRIPLE_R
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REPEAT SECTION 5" = 100'







Calibrator 236.0 237.1 api

Shop	Field	Difference	Tolerance
236.0	237.1	-1.1	+/- 9.00

#### NATURAL GAMMA RAY TOOL POST CALIBRATION

**Tool Name:** GTET - 11016182 **Reference Calibration Date:** 11-Sep-08 08:28:53  
**Engineer:** J. CONRAD **Calibration Date:** 12-Sep-08 15:28:24  
**Software Version:** WL INSITE R2.2 (Build 2) **Calibration Version:** 1

Calibrator Source S/N: TB-271

Calibrator API Reference:236.00 api

Post Verification	Field	Post	Units
Background	31.4	46.7	api
Background + Calibrator	268.5	276.0	api
Calibrator	237.1	229.3	api

Shop	Field	Post	Difference	Tolerance
236.0	237.1	229.3	7.8	+/- 9.00

#### ACCELEROMETER SHOP CALIBRATION

**Tool Name:** GTET - 11016182 **Reference Calibration Date:** 23-Jul-08 09:36:30  
**Engineer:** J.CONRAD **Calibration Date:** 06-Sep-08 15:03:13  
**Software Version:** WL INSITE R2.2 (Build 2) **Calibration Version:** 1

Horizontal-1 Telemetry	Horizontal-2 Telemetry	Vertical Telemetry	Units
-221.91	-239.09	-16556.18	cnts

Coefficient	Coefficient Value	Tolerance
Gain	-0.000061	-0.0010 - 0.0010
Offset	-0.014	----

Orientation	Measured	Calibrated
Horizontal	0.00	-0.00
Vertical	1.00	1.00

#### DUAL SPACED NEUTRON SHOP CALIBRATION

**Tool Name:** DSNT - 11004663 **Reference Calibration Date:** 23-Jul-08 15:09:26  
**Engineer:** K. NORMAND **Calibration Date:** 31-Aug-08 15:20:21  
**Software Version:** WL INSITE R2.2 (Build 2) **Calibration Version:** 1

Logging Source S/N: DSN-32

Tank Serial Number: 105045

Reference value assigned to Tank: 52.630

Snow Block S/N: 37526

Calibration Tank Water Temperature: 78 degF

Min. Tool Housing Outside Diameter: 3.624 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.943	0.943	0.900 - 1.100

#### WATER TANK SUMMARY (Horizontal Water Tank)

Current Reading      Calibrated      Control Limit

Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change
Porosity (dec):	0.2162	0.2163	0.0000	+/- 0.0020
Calibrated Ratio:	9.91	9.91	0.000	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (dec):	0.0660	0.02000 - 0.09000

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

### DUAL SPACED NEUTRON FIELD CALIBRATION

<b>Tool Name:</b>	<b>DSNT - 11004663</b>	<b>Reference Calibration Date:</b>	<b>31-Aug-08 15:20:21</b>
<b>Engineer:</b>	<b>K. NORMAND</b>	<b>Calibration Date:</b>	<b>11-Sep-08 08:47:11</b>
<b>Software Version:</b>	<b>WL INSITE R2.2 (Build 2)</b>	<b>Calibration Version:</b>	<b>1</b>

Logging Source S/N: DSN-32

Snow Block S/N: 37526

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (dec):	0.0660	0.0754	0.0094	+/- 0.0150

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

### DUAL SPACED NEUTRON POST CALIBRATION

<b>Tool Name:</b>	<b>DSNT - 11004663</b>	<b>Reference Calibration Date:</b>	<b>11-Sep-08 08:47:11</b>
<b>Engineer:</b>	<b>J. CONRAD</b>	<b>Calibration Date:</b>	<b>12-Sep-08 15:57:45</b>
<b>Software Version:</b>	<b>WL INSITE R2.2 (Build 2)</b>	<b>Calibration Version:</b>	<b>1</b>

Logging Source S/N: DSN-32

Snow Block S/N: 37526

NEUTRON POST-CHECK SUMMARY				
	Field Value	Post Value	Difference	Control Limit On Change
Snow-Block Porosity (dec):	0.0754	0.0830	0.0076	+/- 0.0150

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

### SPECTRAL DENSITY SHOP CALIBRATION

<b>Tool Name:</b>	<b>SDLT - 10951319</b>	<b>Reference Calibration Date:</b>	<b>23-Jul-08 10:49:50</b>
<b>Engineer:</b>	<b>K. NORMAND</b>	<b>Calibration Date:</b>	<b>31-Aug-08 17:17:17</b>
<b>Software Version:</b>	<b>WL INSITE R2.2 (Build 2)</b>	<b>Calibration Version:</b>	<b>1</b>

Logging Source S/N: 5116GW

Aluminum Block S/N: 8261

Magnesium Block S/N: 8260

Density: 2.602g/cc

Density: 1.688g/cc

DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	0.9990	0.9961	0.90 - 1.10
Near Dens Gain	1.0030	0.9931	0.90 - 1.10
Near Peak Gain	0.9950	1.0052	0.90 - 1.10
Near Lith Gain	0.9916	0.9840	0.90 - 1.10
Far Bar Gain	1.0093	1.0109	0.90 - 1.10
Far Dens Gain	0.9955	0.9970	0.90 - 1.10
Far Peak Gain	0.9922	0.9912	0.90 - 1.10
Far Lith Gain	0.9704	0.9691	0.90 - 1.10
Near Bar Offset	0.0911	0.1211	NONE
Near Dens Offset	0.0110	0.1001	NONE
Near Peak Offset	0.0761	-0.0105	NONE
Near Lith Offset	0.0740	0.1358	NONE
Far Bar Offset	-0.0384	-0.0525	NONE
Far Dens Offset	0.0684	0.0546	NONE
Far Peak Offset	0.0802	0.0885	NONE
Far Lith Offset	0.2294	0.2416	NONE
Near Bar Background	911.56	907.55	700 - 1450
Near Dens Background	297.63	298.66	230 - 480
Near Peak Background	125.77	127.31	100 - 210
Near Lith Background	160.47	160.76	125 - 260
Far Bar Background	577.09	573.99	450 - 900
Far Dens Background	221.27	220.29	175 - 345
Far Peak Background	86.68	86.45	70 - 140
Far Lith Background	90.11	89.86	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.688	1.688	0.000	+/- 0.015
Pe	2.562	2.594	0.032	+/- 0.150
ALUMINUM				
Density (g/cc)	2.600	2.602	0.002	+/- 0.01500
Pe	3.156	3.183	0.027	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0020	+/- 0.0110	-0.0017	+/- 0.0140
Magnesium Block	0.0007	+/- 0.0110	-0.0008	+/- 0.0140
Aluminum Block	-0.0010	+/- 0.0110	-0.0008	+/- 0.0140
Resolution	9.13	6.00 - 11.50	9.43	6.00 - 11.50
Internal Verifier(B+D+P+L)	1494	1200 - 2700	971	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 - 10951319

**Reference Calibration Date:** 31-Aug-08 17:17:17

**Engineer:** K. NORMAND

**Calibration Date:** 11-Sep-08 08:31:04

**Software Version:** WL INSITE R2.2 (Build 2)

**Calibration Version:** 1

Aluminum Block S/N: 8261

Density: 2.602g/cc

Magnesium Block S/N: 8260

Density: 1.688g/cc

Pad Temperature: 71.7 degF

#### DENSITY FIELD CALIBRATION SUMMARY

Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1494.273	1484.885	-9.388	15.578
Far (B+D+P+L) cps	970.595	971.254	0.659	16.749
Near Resolution	9.13	9.11	-0.020	0.50
Far Resolution	9.58	9.43	0.150	1.00

#### PASS/FAIL SUMMARY

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

### SPECTRAL DENSITY POST CHECK

**Tool Name:** SDLT - 10951319

**Reference Calibration Date:** 11-Sep-08 08:31:04

**Engineer:** J. CONRAD

**Calibration Date:** 12-Sep-08 15:29:19

**Software Version:** WL INSITE R2.2 (Build 2)

**Calibration Version:** 1

Aluminum Block S/N: 8261

Density: 2.602g/cc

Magnesium Block S/N: 8260

Density: 1.688g/cc

Pad Temperature: 85.8 degF

#### DENSITY POST CALIBRATION SUMMARY

Measurement	Field	Post	Change	Control Limit +/-
Near (B+D+P+L) cps	1484.885	1490.955	6.070	15.578
Far (B+D+P+L) cps	971.254	971.105	-0.149	16.749
Near Resolution	9.11	9.15	0.040	0.50
Far Resolution	9.81	9.58	0.230	1.00

#### PASS/FAIL SUMMARY

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

### DENSITY CALIPER SHOP CALIBRATION

**Tool Name:** SDLT - 10951319

**Reference Calibration Date:** 31-Aug-08 17:47:47

**Engineer:** K. NORMAND

**Calibration Date:** 31-Aug-08 17:55:23

**Software Version:** WL INSITE R2.2 (Build 2)

**Calibration Version:** 1

#### CALIBRATION COEFFICIENTS

Measurement 1 Density Value Near Value Control Limit On

Measurement	Previous Value	New Value	New Value
Pad Offset	-2260.04	-2330.36	-7000.00 - -1000.00
Pad Gain	0.0003875	0.0003873	0.000200 - 0.000600
Arm Offset	-2881.14	-2744.36	-5000.00 - 3000.00
Arm Gain	0.0005196	0.0005179	0.000300 - 0.000700
Arm Power	-0.000001808	-0.000002556	-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)	2.03	2.00	-0.0300	+/- 0.200
Medium Ring (in)	3.78	3.75	-0.0300	+/- 0.200
RING DIAMETER:				
Small Ring (in)	6.47	6.500	0.0300	+/- 0.200
Medium Ring (in)	8.24	8.250	0.0100	+/- 0.200
Large Ring (in)	15.17	15.000	-0.1700	+/- 0.200

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

#### SDLT CALIPER FIELD CALIBRATION

<b>Tool Name:</b>	<b>SDLT - 10951319</b>	<b>Reference Calibration Date:</b>	<b>31-Aug-08 17:55:23</b>
<b>Engineer:</b>	<b>K. NORMAND</b>	<b>Calibration Date:</b>	<b>11-Sep-08 08:43:40</b>
<b>Software Version:</b>	<b>WL INSITE R2.2 (Build 2)</b>	<b>Calibration Version:</b>	<b>1</b>

MEASURED CALIPER VALUES				
Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.66	-0.09	+/- 0.10
Ring Diameter	8.250	8.28	0.03	+/- 0.15

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

#### SDLT CALIPER POST CALIBRATION

<b>Tool Name:</b>	<b>SDLT - 10951319</b>	<b>Reference Calibration Date:</b>	<b>11-Sep-08 08:43:40</b>
<b>Engineer:</b>	<b>J. CONRAD</b>	<b>Calibration Date:</b>	<b>12-Sep-08 15:33:06</b>
<b>Software Version:</b>	<b>WL INSITE R2.2 (Build 2)</b>	<b>Calibration Version:</b>	<b>1</b>

MEASURED CALIPER VALUES				
Measurement	Field	Post	Change	Control Limit On New Value
Pad Extension	3.66	3.64	-0.02	+/- 0.10
Ring Diameter	8.283	8.14	-0.14	+/- 0.15

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

# ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name: ACRT - I907S909

Reference Calibration Date: 08-Sep-08 18:01:25

Engineer: J. MELANCON

Calibration Date: 08-Sep-08 18:10:43

Software Version: WL INSITE R2.2 (Build 2)

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	0.9973	1.05	0.95	1.0054	1.05	0.95	1.0114	1.05
A2 (50")	0.95	1.0021	1.05	0.95	1.0107	1.05	0.95	1.0185	1.05
A3 (29")	0.95	0.9968	1.05	0.95	1.0036	1.05	0.95	1.0081	1.05
A4 (17")	0.95	1.0033	1.05	0.95	1.0079	1.05	0.95	1.0144	1.05
A5 (10")	N/A	N/A	N/A	0.95	0.9959	1.05	0.95	1.0018	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9816	1.05	0.95	0.9867	1.05

## TYPICAL SONDE OFFSET RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	-3	-0.514	-1	-6	-4.092	-2	-6	-4.665	-2
A2 (50")	-6	-2.844	-2	-6	-3.972	-2	-6	-4.264	-2
A3 (29")	-27	-12.159	-9	-9	-3.204	-3	-9	-2.869	-3
A4 (17")	-180	-94.415	-60	-45	-30.026	-15	-39	-24.498	-13
A5 (10")	N/A	N/A	N/A	-150	-67.071	-50	-90	-35.180	-30
A6 (6")	N/A	N/A	N/A	175	285.828	525	90	147.136	270

## TRANSMITTER CURRENT GAIN

Signal	Lower	R	Upper
12K	0.75	0.9438	1.4
36K	1.0	1.3948	2.4
72K	1.25	1.6321	2.5

## R-MUD VERIFICATION

Signal	Lower (ohm-m)	Measured (ohmm)	Upper (ohm-m)
Mud Cell	0.95	1.000	1.05

## CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11016182						
Gamma Ray Calibrator	236.0	237.1	229.3	7.8	+/- 9.00	api
AccZ Horizontal	-0.00	-----	-----	0.00	-----	g
AccZ Vertical	1.00	-----	-----	0	-----	g
DSNT-11004663						
Snow-Block Porosity	0.0660	0.0754	0.0830	-0.0076	+/- +/-0.0150	decP
SDLT-10951319						
Near(B+D+P+L)	1494.273	1484.885	1490.955	-6.070	+/-15.578	cps
Far(B+D+P+L)	970.595	971.254	971.105	0.149	+/-16.749	cps
CALIPER RING 1	8.250	8.28	8.14	0.140	+/-0.15	in
ACRT-I907S909						
Mud Cell	1.000	-----	-----	0.000	-----	ohmm

Data: FED\_SMITH\_21\_120001 LOGIC TRIPLE COMBO\IDLE

Date: 12-Sep-08 15:59:16

**HALLIBURTON**

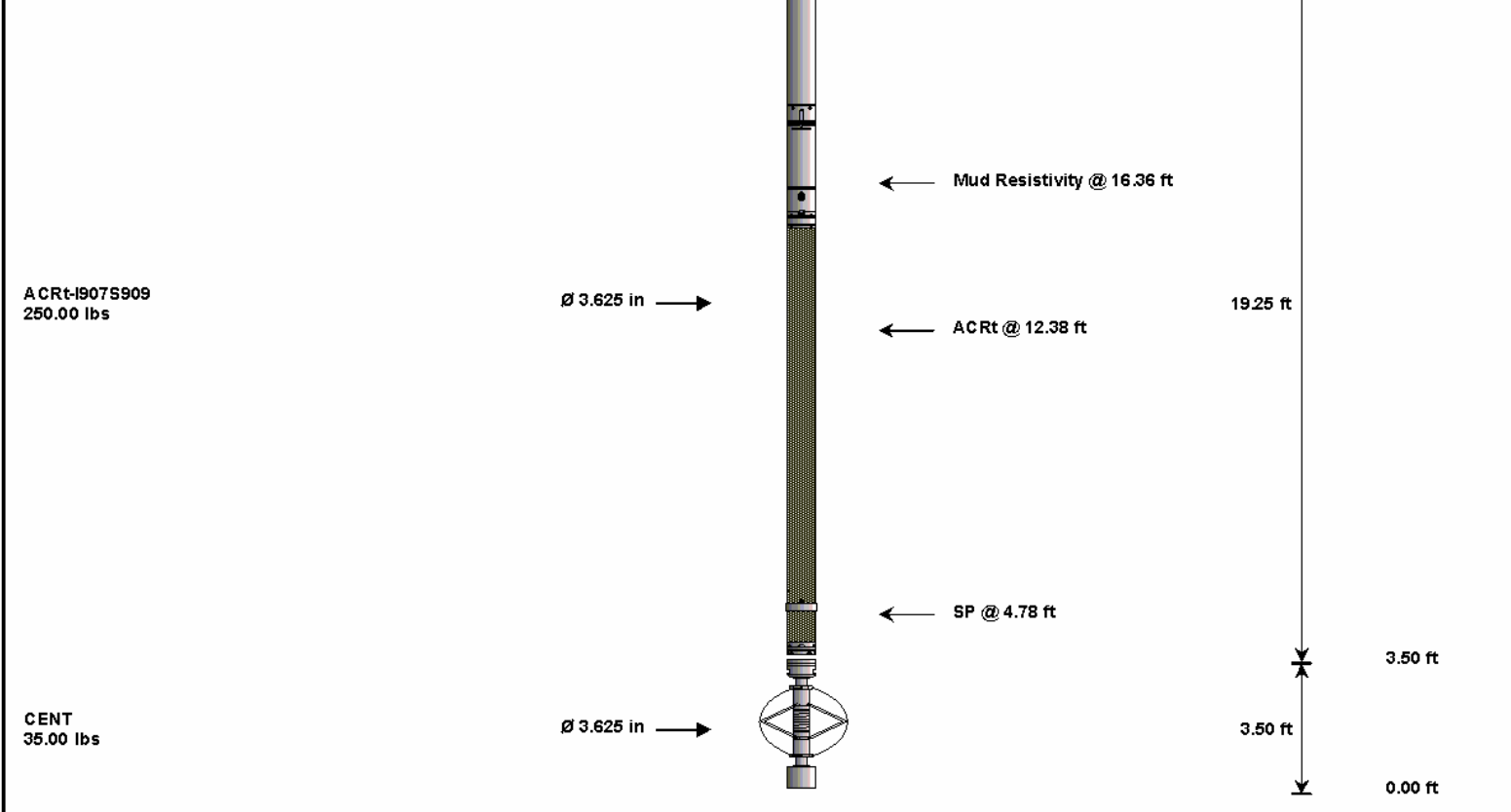
**CUSTOMER EVENT LOG**

Event Type	Time & Date	Depth (ft)	Event Description
	12-Sep-08 11:56:58	1201.00	Logging 001 12-Sep-08 11:56 Up @1200.8f
	12-Sep-08 12:03:17	854.46	Halting 001 12-Sep-08 11:56 Up @1200.8f
	12-Sep-08 12:03:53	762.25	Logging 002 12-Sep-08 12:03 Dn @761.5f
	12-Sep-08 12:31:22	7306.82	Halting 002 12-Sep-08 12:03 Dn @761.5f
	12-Sep-08 12:31:37	7319.25	Logging 003 12-Sep-08 12:31 Up @7319.3f
	12-Sep-08 12:38:31	6968.40	Halting 003 12-Sep-08 12:31 Up @7319.3f
	12-Sep-08 12:42:08	7314.00	Logging 004 12-Sep-08 12:42 Up @7315.3f
	12-Sep-08 14:43:40	86.56	Halting 004 12-Sep-08 12:42 Up @7315.3f
Data: FED_SMITH_21_1210001 LOGIC TRIPLE COMBO\HWI0227			Date: 12-Sep-08 14:56:08

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
RWCH-C089 135.00 lbs	Ø 3.625 in		Load Cell @ 54.34 ft BH Temperature @ 53.77 ft	6.25 ft	58.02 ft
GTET-11016182 165.00 lbs	Ø 3.625 in		GammaRay @ 45.71 ft	8.52 ft	51.77 ft
DSNT-11004663 174.00 lbs	Ø 3.625 in		DSN Far @ 36.31 ft DSN Near @ 35.56 ft	9.69 ft	43.25 ft
SDLT-10951319 360.00 lbs	Ø 4.500 in Ø 4.750 in		SDL Microlog @ 25.75 ft SDL Caliper @ 25.57 ft SDL @ 25.56 ft	10.81 ft	33.56 ft
					22.75 ft



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max. Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head	C089	135.00	6.25	51.77	300.00
GTET	Natural Gamma Ray Tool	11016182	165.00	8.52	43.25	60.00
DSNT	Dual Spaced Neutron	11004663	174.00	9.69	33.56	60.00
SDLT	Spectral Density Tool	10951319	360.00	10.81	22.75	60.00
ACRt	Array Compensated True Resistivity	I907S909	250.00	19.25	3.50	300.00
SP	SP Ring	PROTO1	5.00	0.25	*	4.78
CENT	Bottom Centralizer	CENT	35.00	3.50	0.00	300.00
Total			1,124.00	58.02		
* Not included in Total Length and Length Accumulation.						
Data: FED_SMITH_21_12\0001 LOGIC TRIPLE COMBO\004 12-Sep-08 12:42 Up @7315.3f				Date: 12-Sep-08 14:18:56		

COMPANY	ENCANA OIL & GAS (USA) INC.		
WELL	FEDERAL SMITH 21-12		
FIELD	PARACHUTE		
COUNTY	GARFIELD	STATE	CO
<b>HALLIBURTON</b>		DUAL SPACED NEUTRON SPECTRAL DENSITY ARRAY COMPENSATED TRUE RESISTIVITY	