

HALLIBURTON

SPECTRAL DENSITY DUAL SPACED NEUTRON ARRAY COMPENSATED TURE RESISTIVITY

COMPANY		KERR-MCGEE OIL & GAS ONSHORE LP	
WELL		BADDING 14-35SX	
FIELD		WATTENBERG	
COUNTY		WELD	
STATE		CO	
Permanent Datum		GL	
Log measured from		KB	
Drilling measured from		KB	
Date		10-Apr-11	
Run No.		ONE	
Depth - Driller		5125.00 ft	
Depth - Logger		5124.0 ft	
Bottom - Logged Interval		5115.0 ft	
Top - Logged Interval		CASING	
Casing - Driller		8.625 in @ 1159.0 ft	
Casing - Logger		1160.0 ft	
Bit Size		7.875 in @	
Type Fluid in Hole		WATER BASED MUD	
Density		8.6 ppg	
Viscosity		27.00 s/qt	
PH		7.00 pH	
Source of Sample		MUD CELL	
Rm @ Meas. Temperature		2.510 ohmm @ 75.00 degF	
Rmf @ Meas. Temperature		2.13 ohmm @ 75.00 degF	
Rmc @ Meas. Temperature		2.750 ohmm @ 75.00 degF	
Source Rmf		CHART	
Rm @ BHT		1.38 ohmm @ 142.0 degF	
Time Since Circulation		6.0 hr	
Time on Bottom		10-Apr-11 19:45	
Max. Rec. Temperature		142.0 degF @ 5124.0 ft	
Equipment		11454566	
Recorded By		C. GULLETT	
Witnessed By		R. TUCKER	

Service Ticket No.: 8096471		API Serial No.: 05123320480000		PGM Version: WL INSITE R3.2.3 (Build 5)			
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.
Rmf @ Meas. Temp.	@	@		ONE	ACRt -	N/A	1.5" STANDOFF
Rmc @ Meas. Temp.	@	@			E2817-S4353		
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.	11294346	Serial No.		Serial No.	M271-P123	Serial No.	10958655
Model No.	GTET	Model No.		Model No.	SDLT	Model No.	DSNT
Diameter	3.625"	No. of Cent.		Diameter	4.75"	Diameter	3.625"
Detector Model No.	102-T	Spacing		Log Type	GAMMA-GAMMA	Log Type	THERMAL
Type	SCINT			Source Type	Cs137	Source Type	Am241Be
Length	8"	LSA [Y/N]		Serial No.	2770GW	Serial No.	DSN-434
Distance to Source	9.5'	FWDA [Y/N]		Strength	1.5 Ci	Strength	15 Ci

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	0.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	2.000	ohmm
	SHARED	TRM	Temperature of Mud	75.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	4.500	in
	SHARED	ST	Surface Temperature	55.0	degF
	SHARED	TD	Total Well Depth	5125.00	ft
	SHARED	BHT	Bottom Hole Temperature	200.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	Temperature Master Tool	NONE	
	SHARED	BHSM	Borehole Size Master Tool	NONE	
	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	Centered	
	DNNT	DNOK	Process DNN?	Yes	

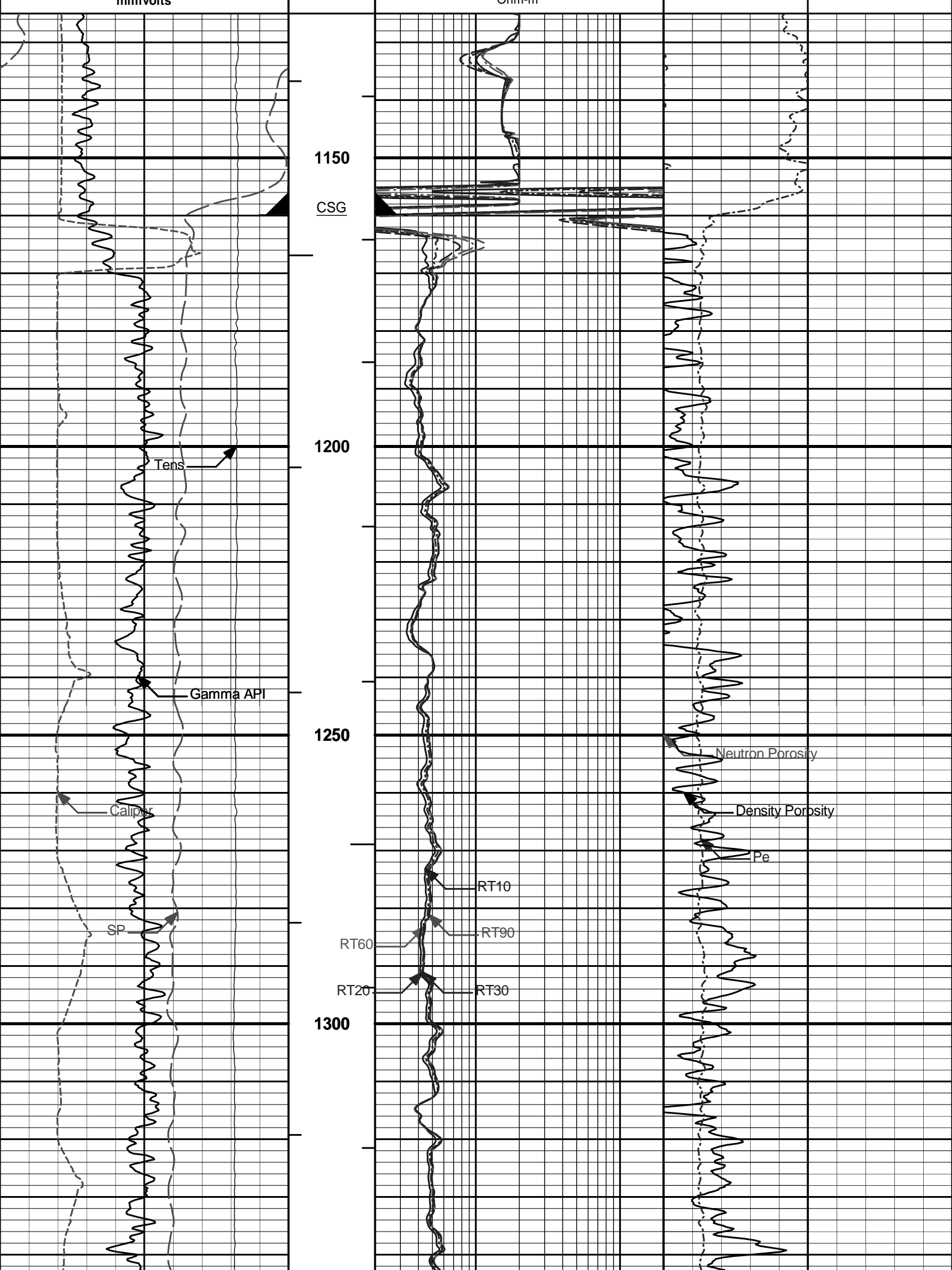
BOTTOM

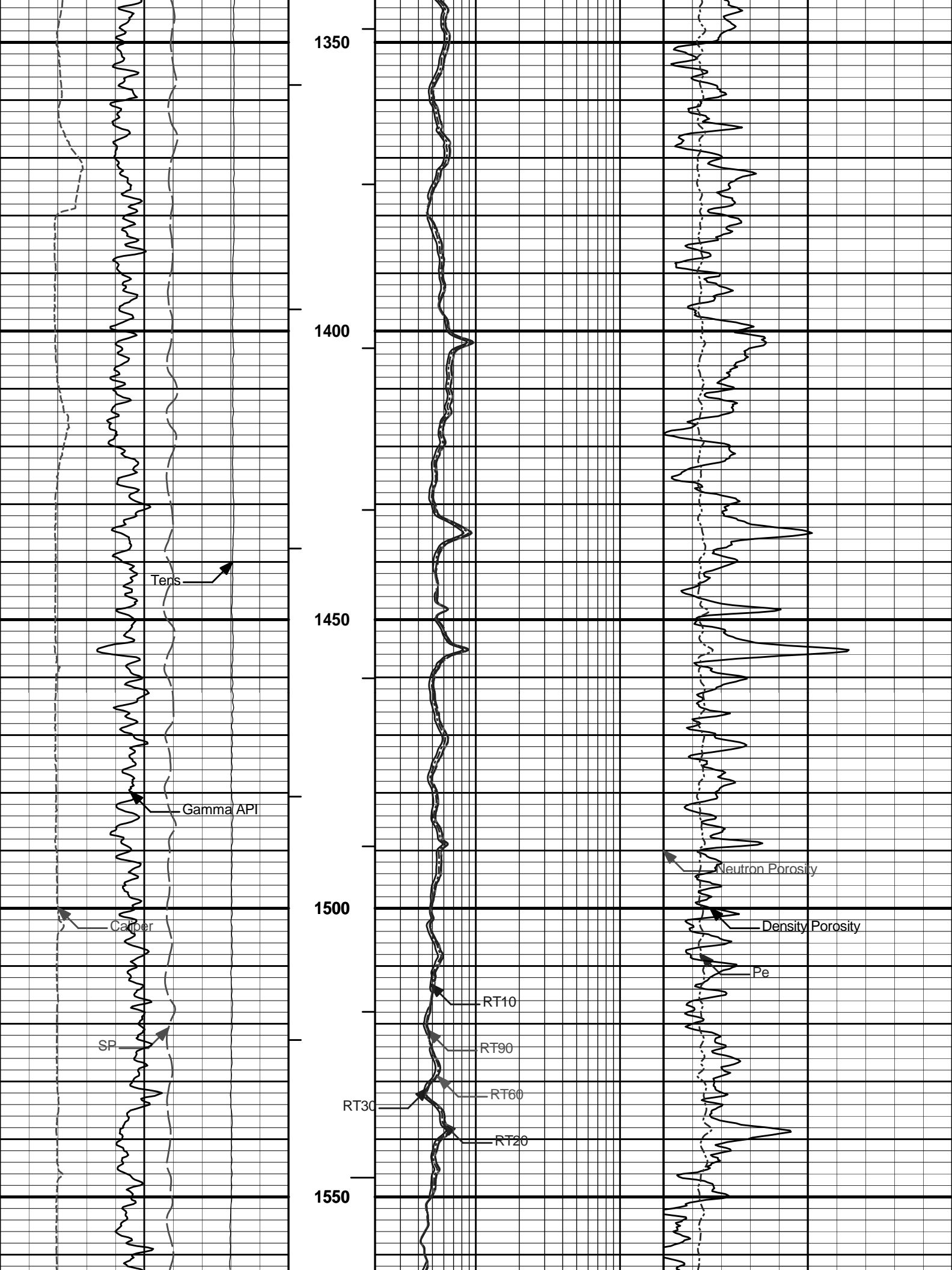
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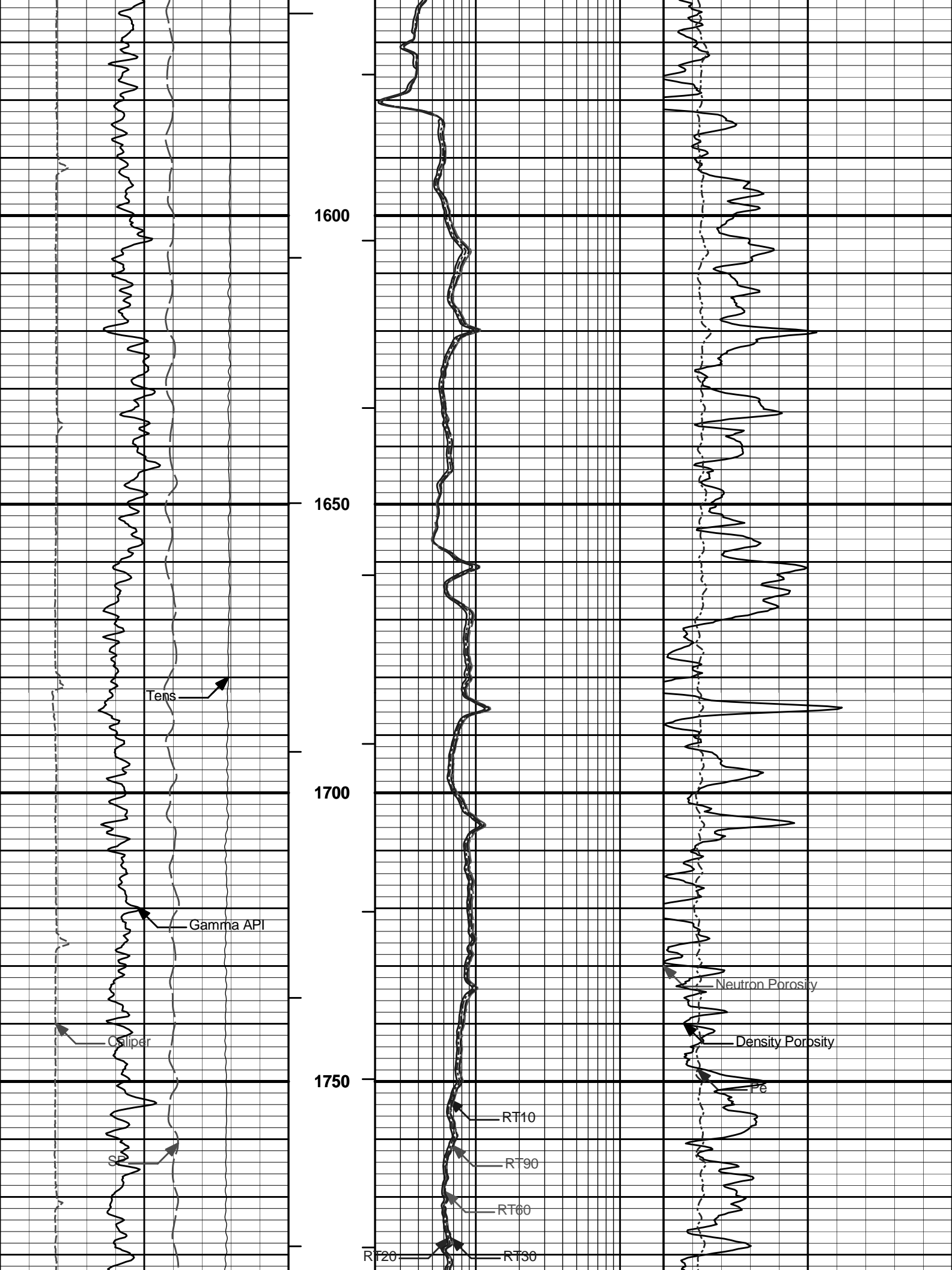
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Plot File: \\COMP\MAIN

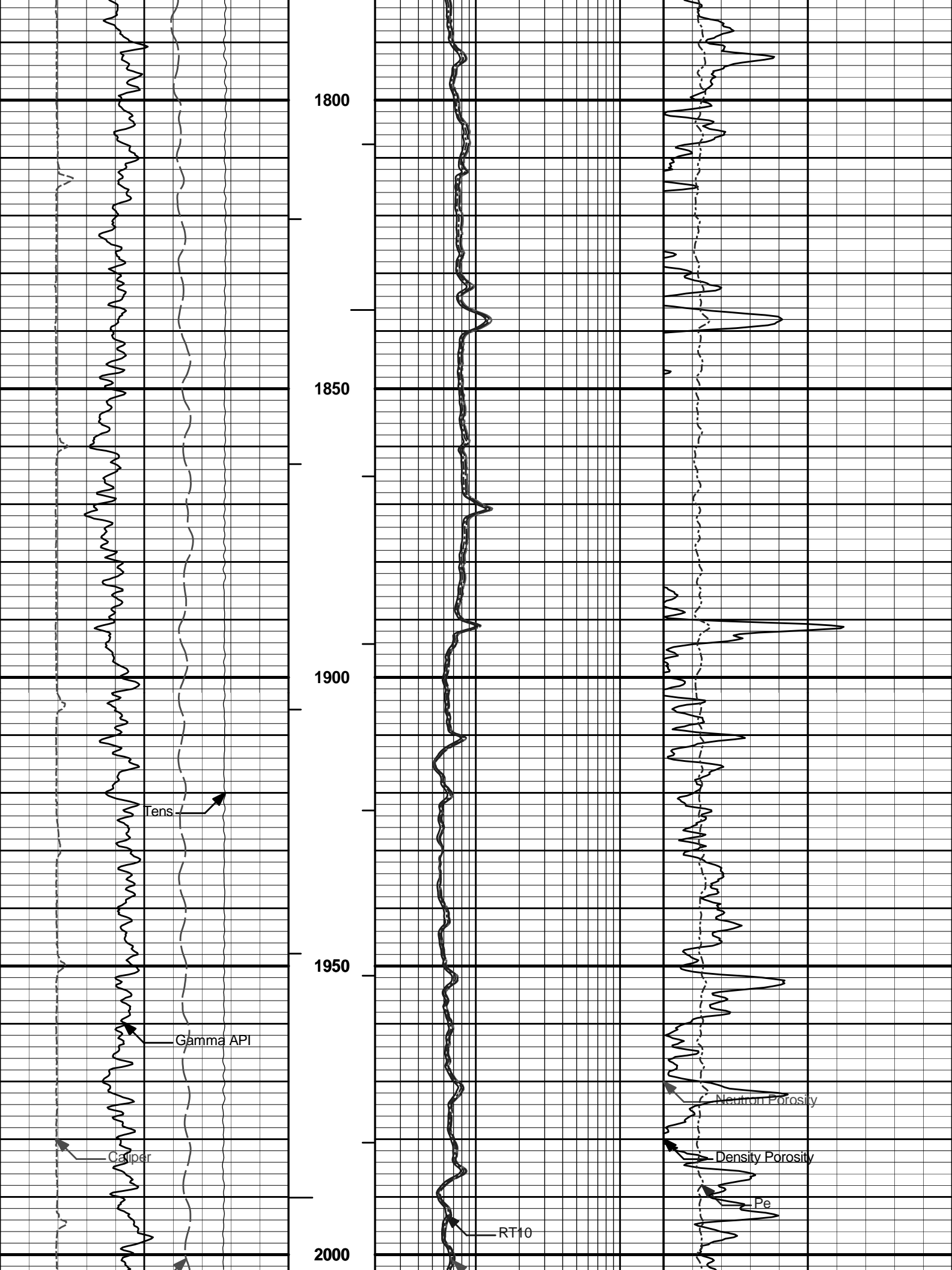
MAIN PASS 5" = 100'

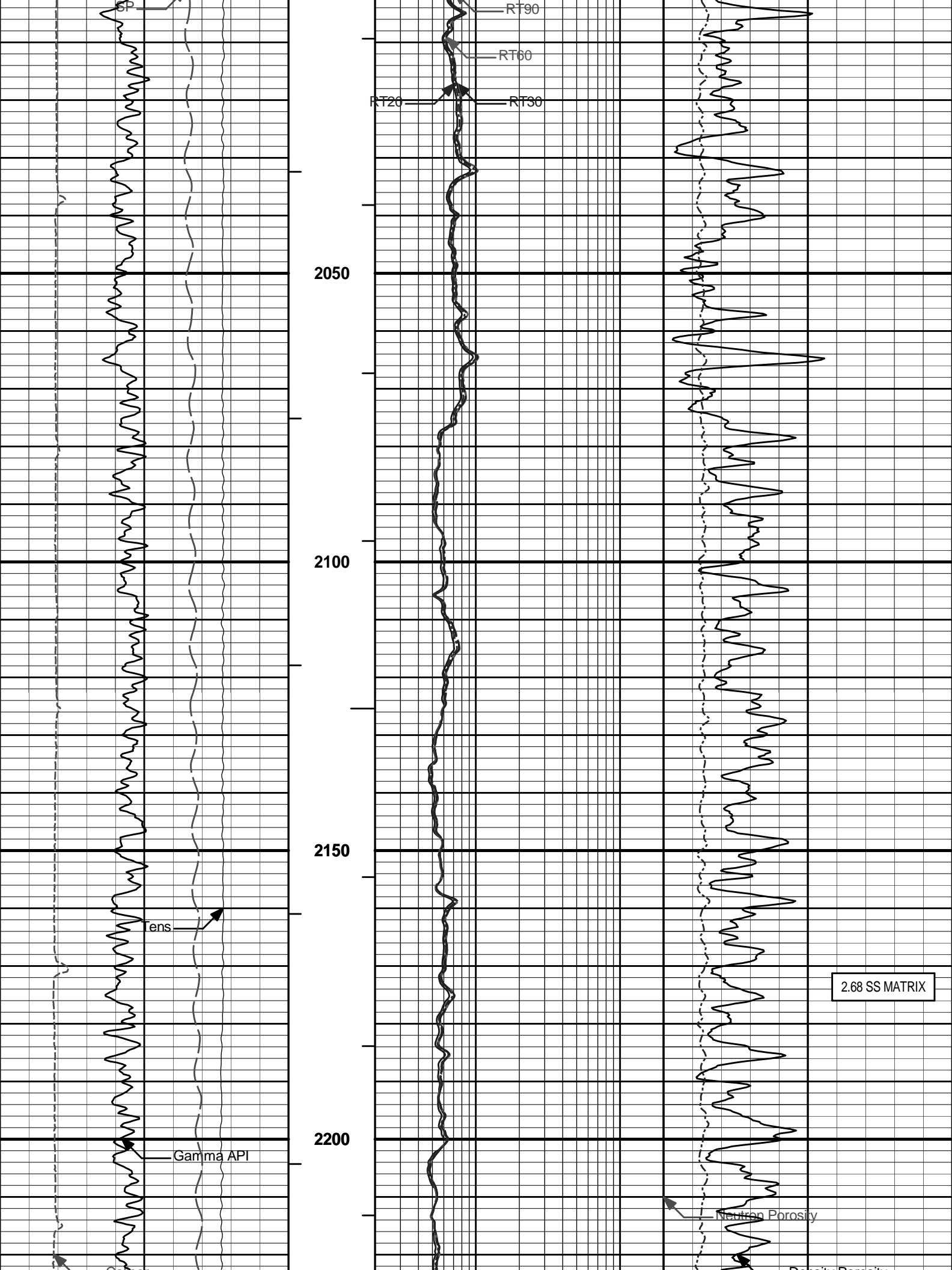
Track 1			Depth Track	Track 2		Track 5	Track 3
10K Tens 0 pounds			AHVT	2 RT10 200			
				Ohm-m			
				2 RT20 200			
6 Caliper 16 inches			BHVT	2 RT30 200	20 Neutron Porosity 0 percent		
0 Gamma API 250 api				2 RT60 200	20 Density Porosity 0 percent		
0 SP 100 millivolts			1 : 240	2 RT90 200	0 Pe 10		

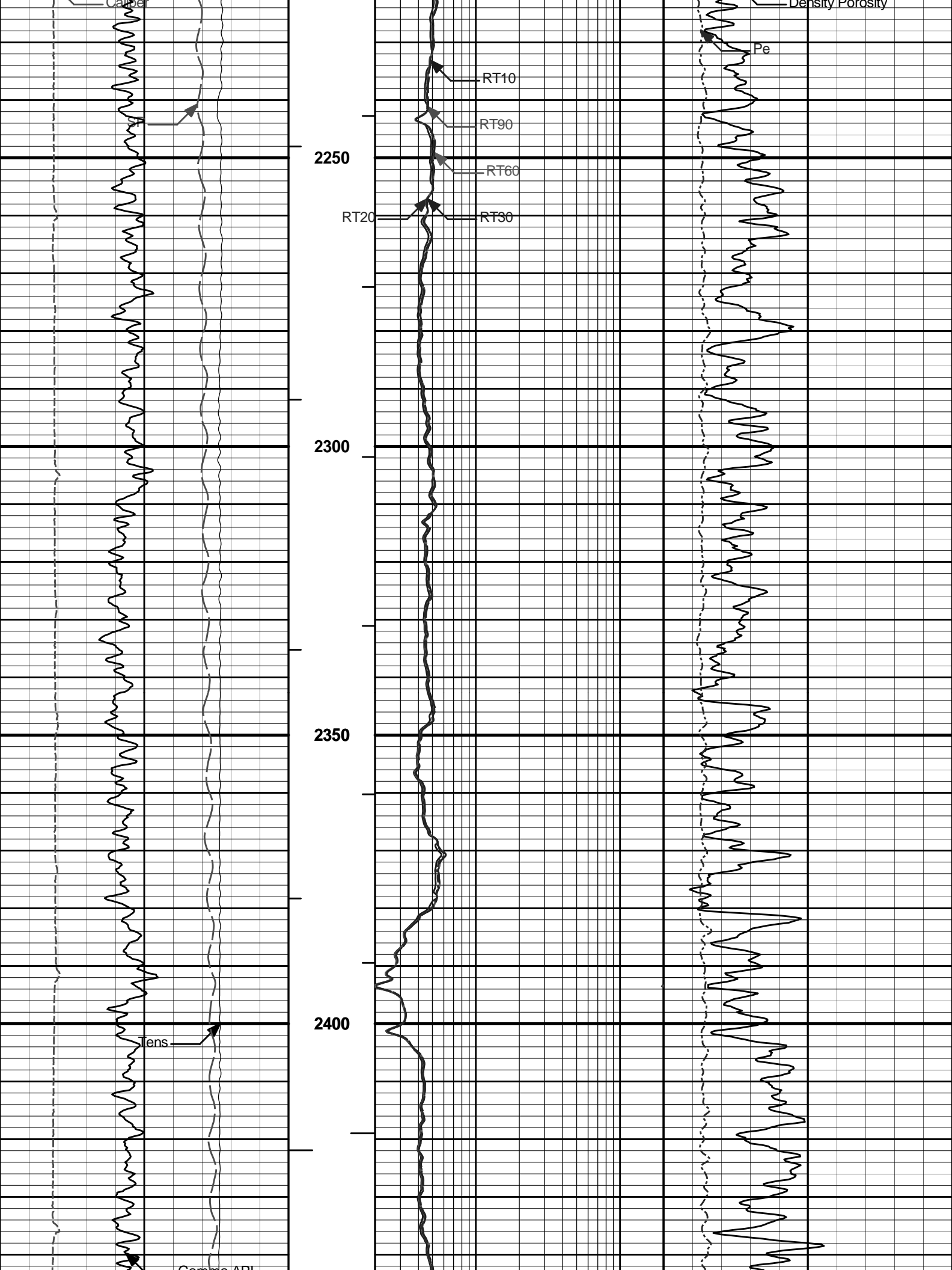


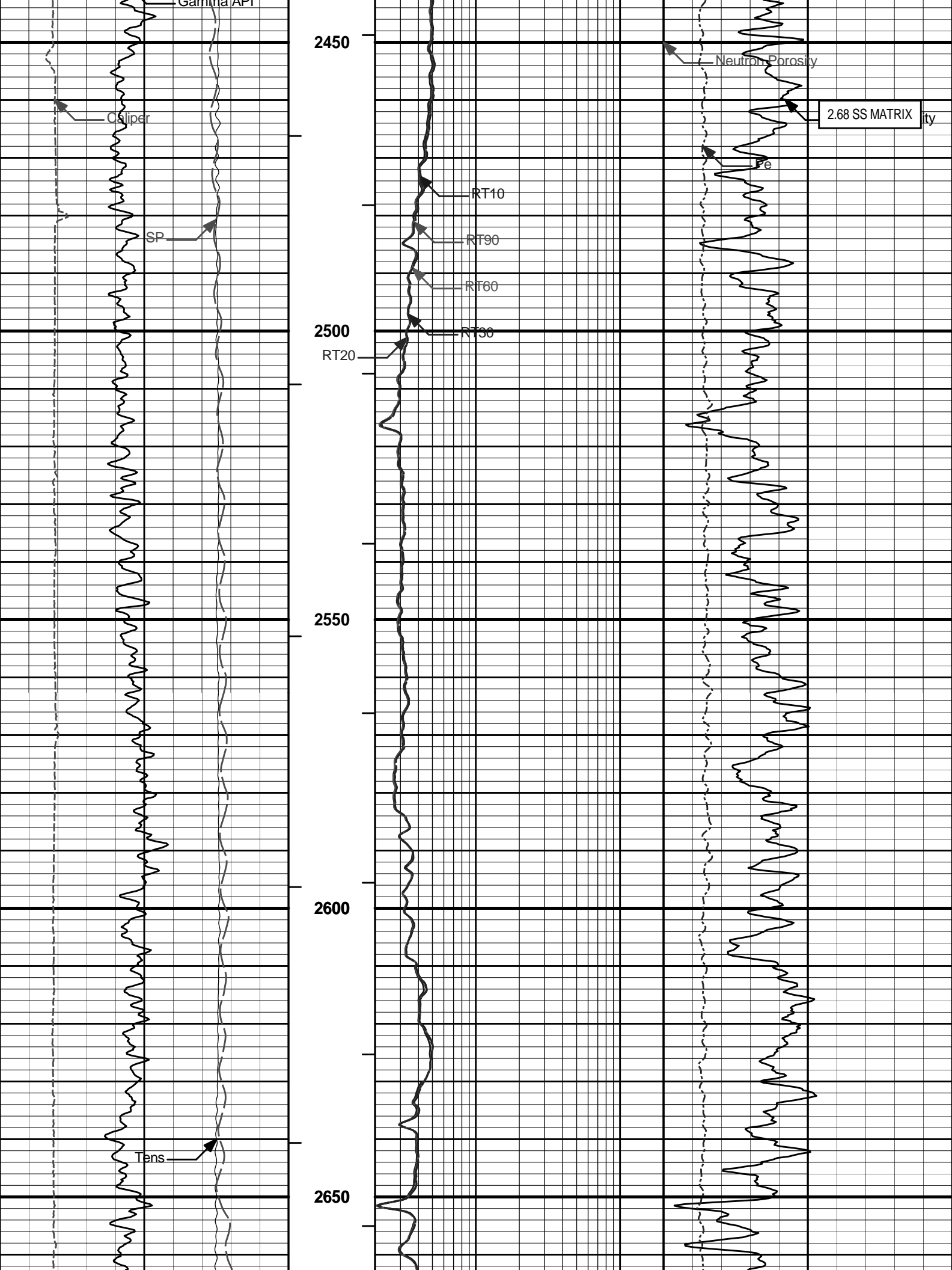


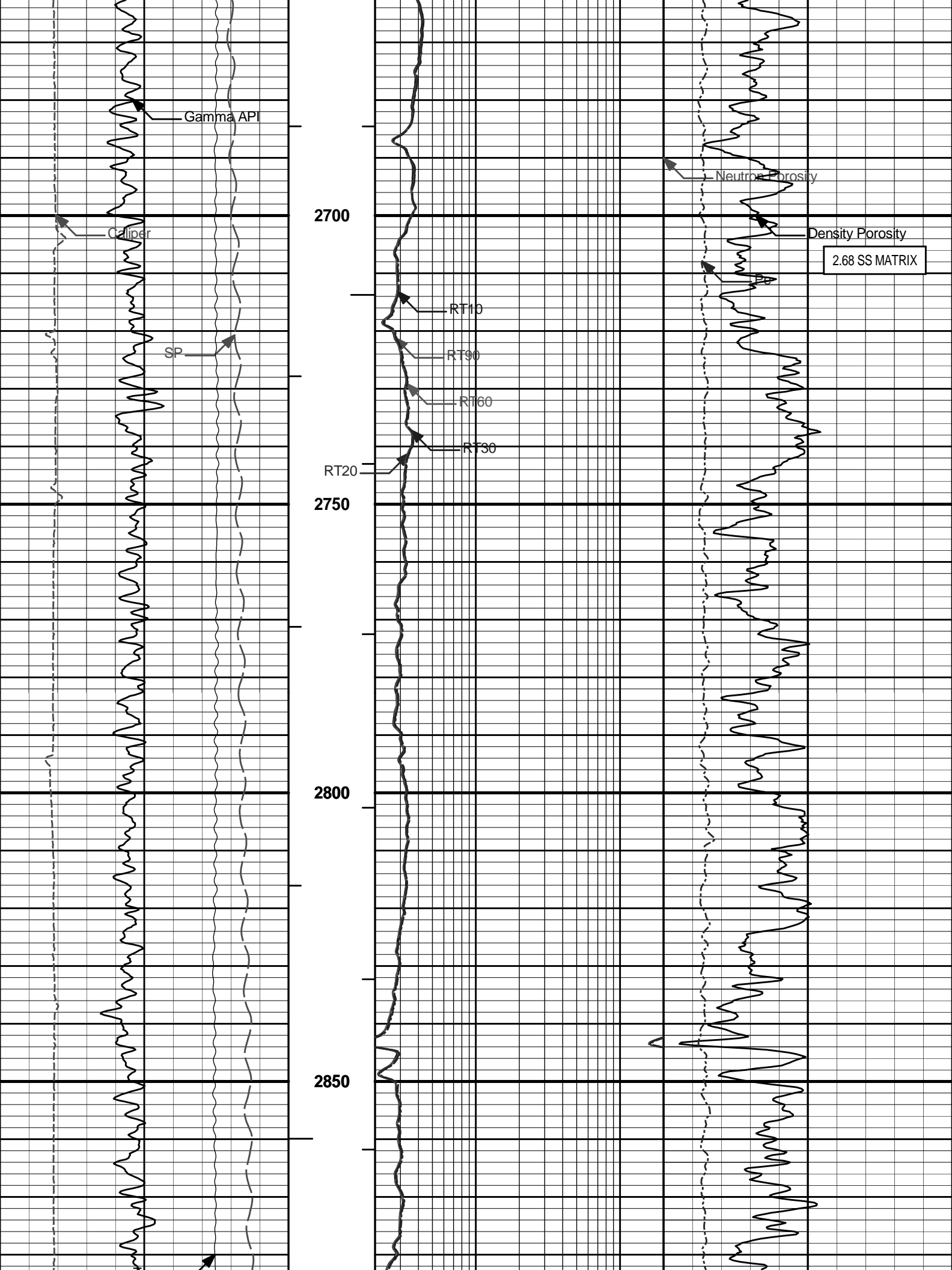


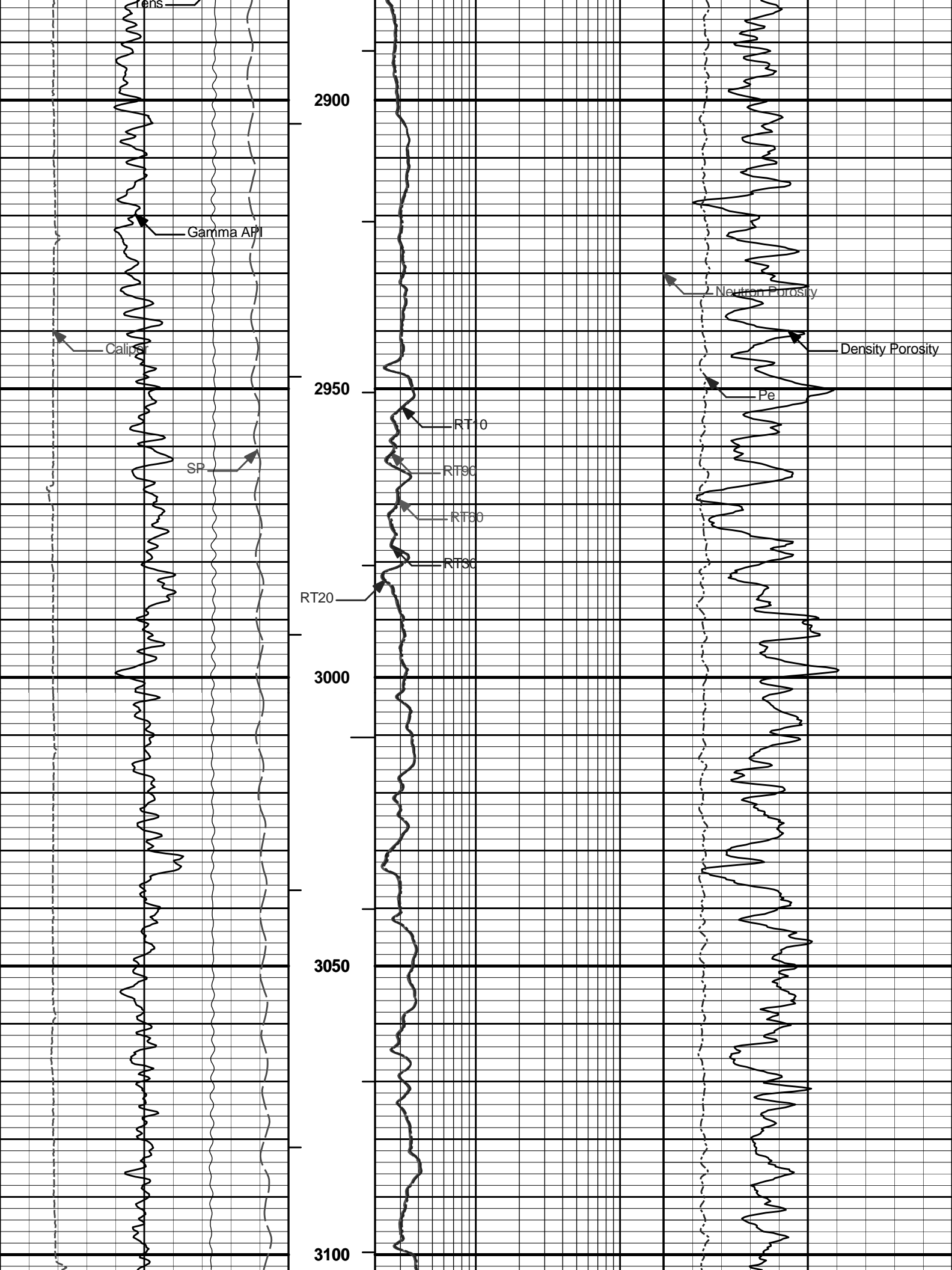


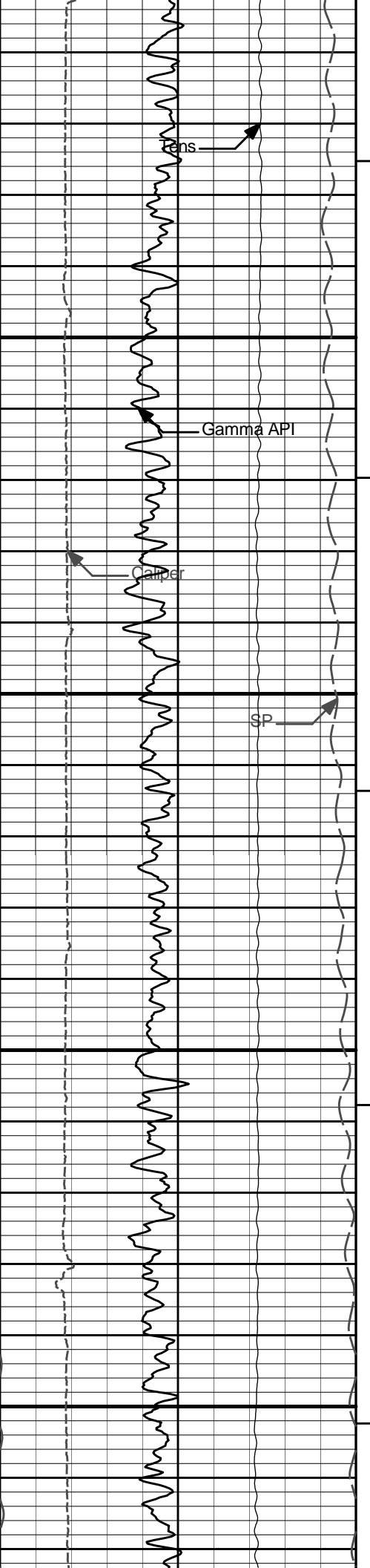










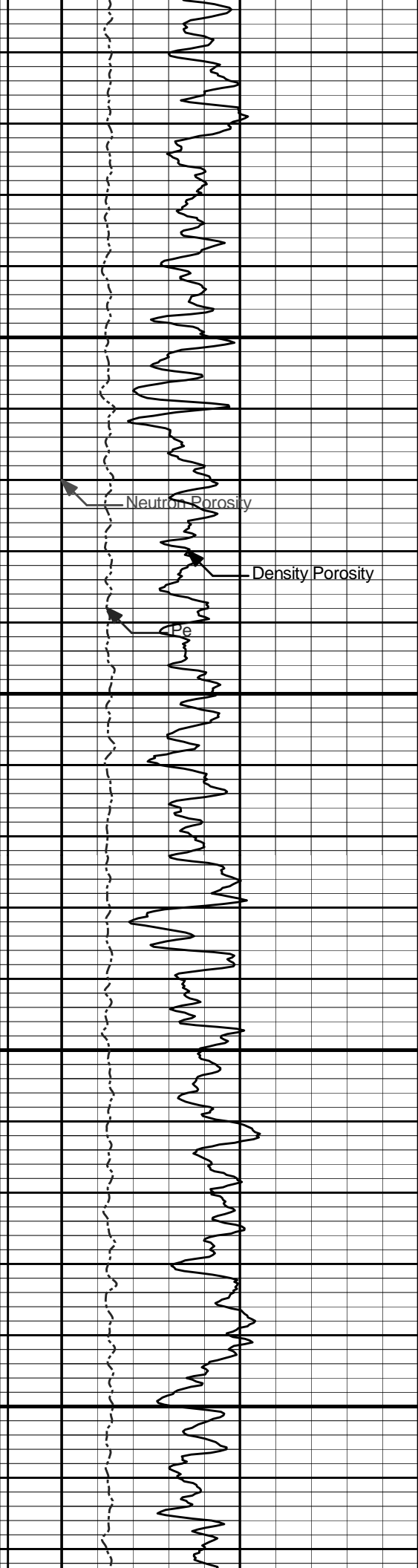
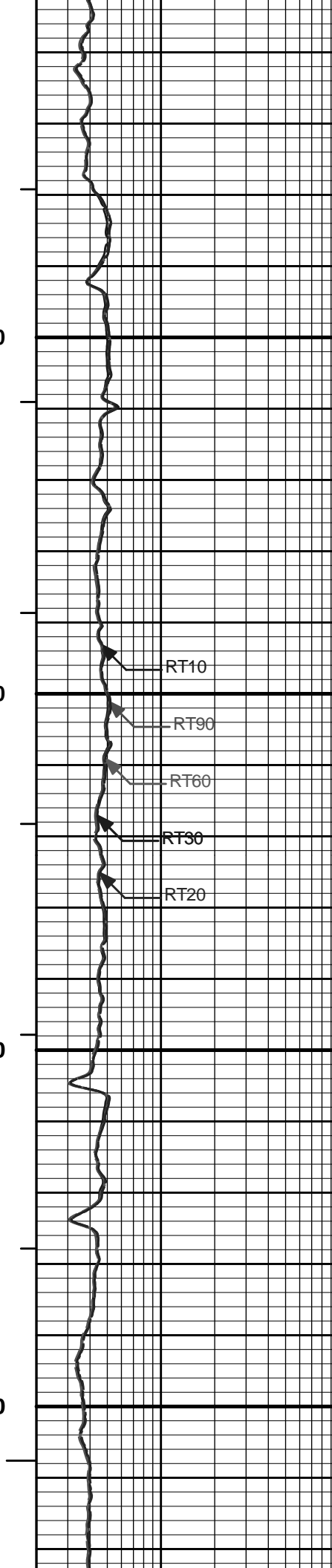


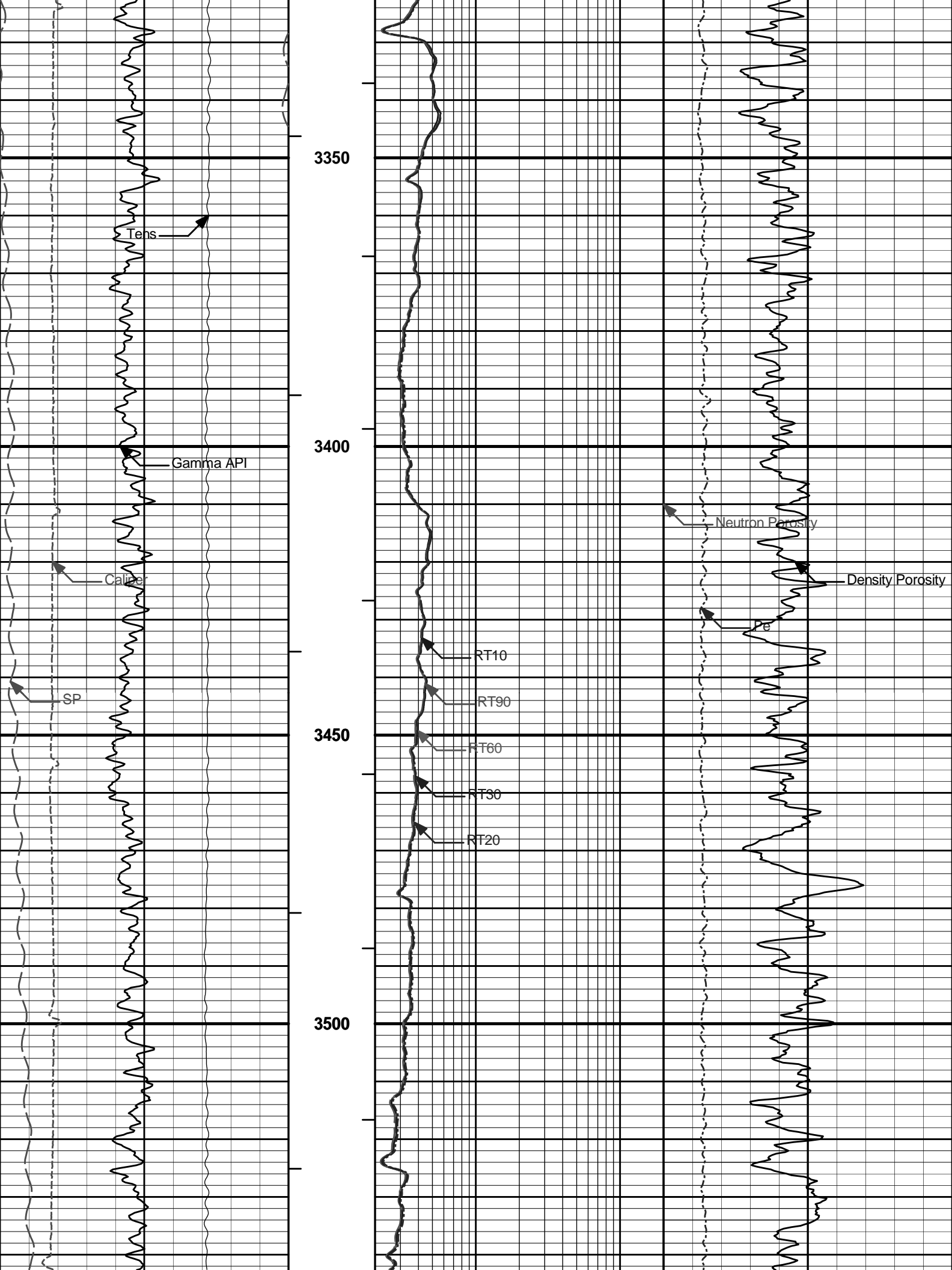
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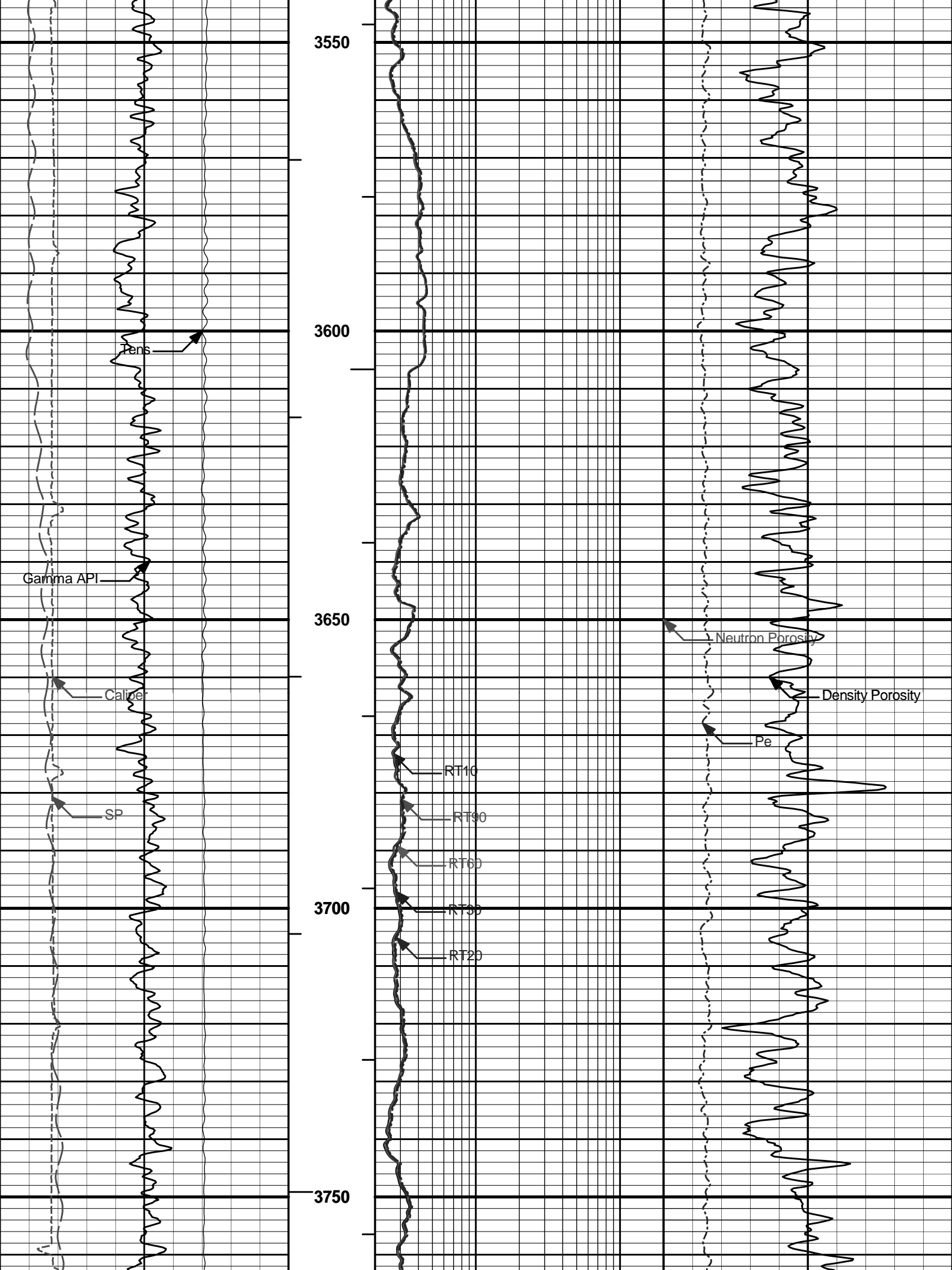
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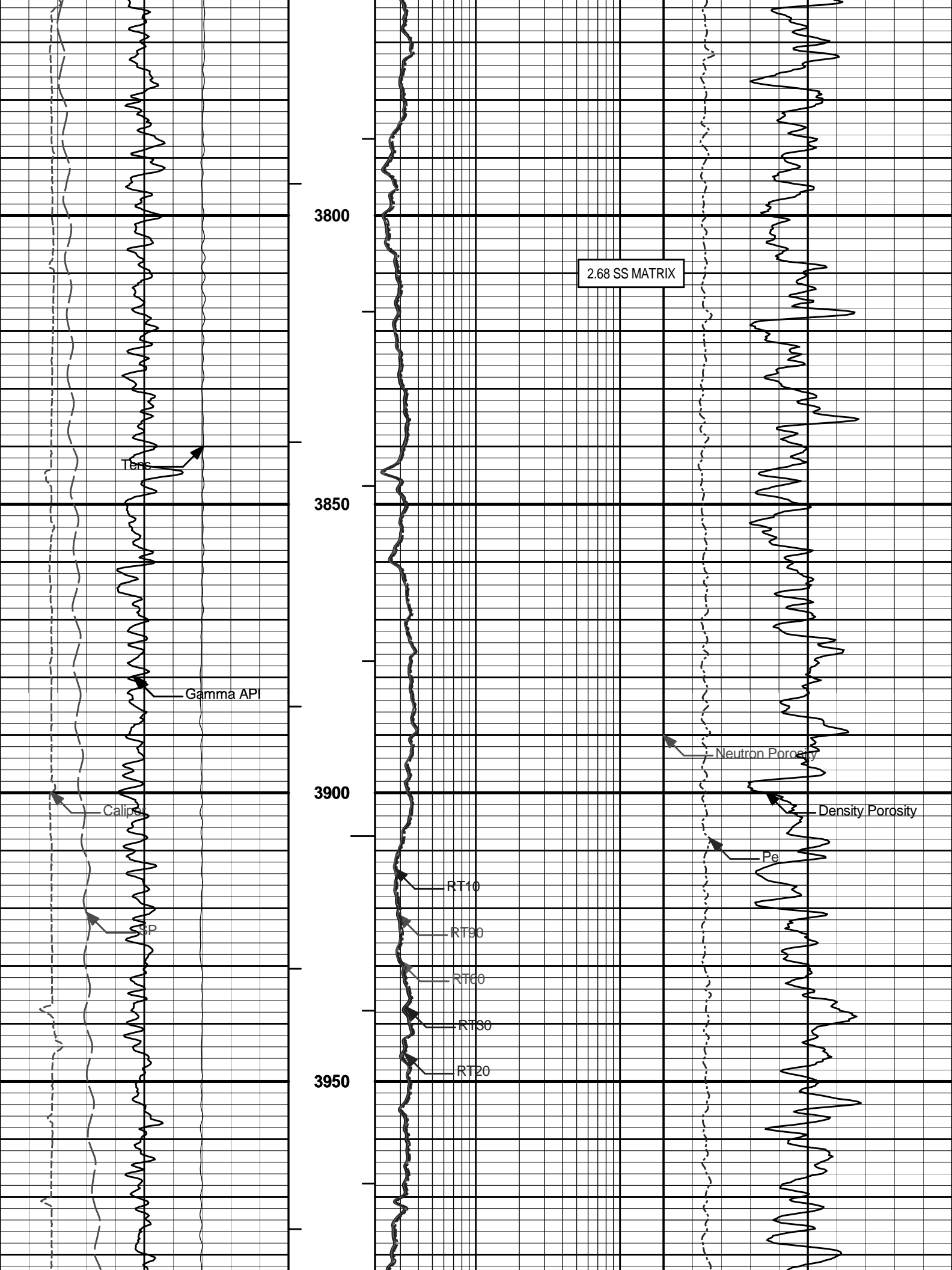
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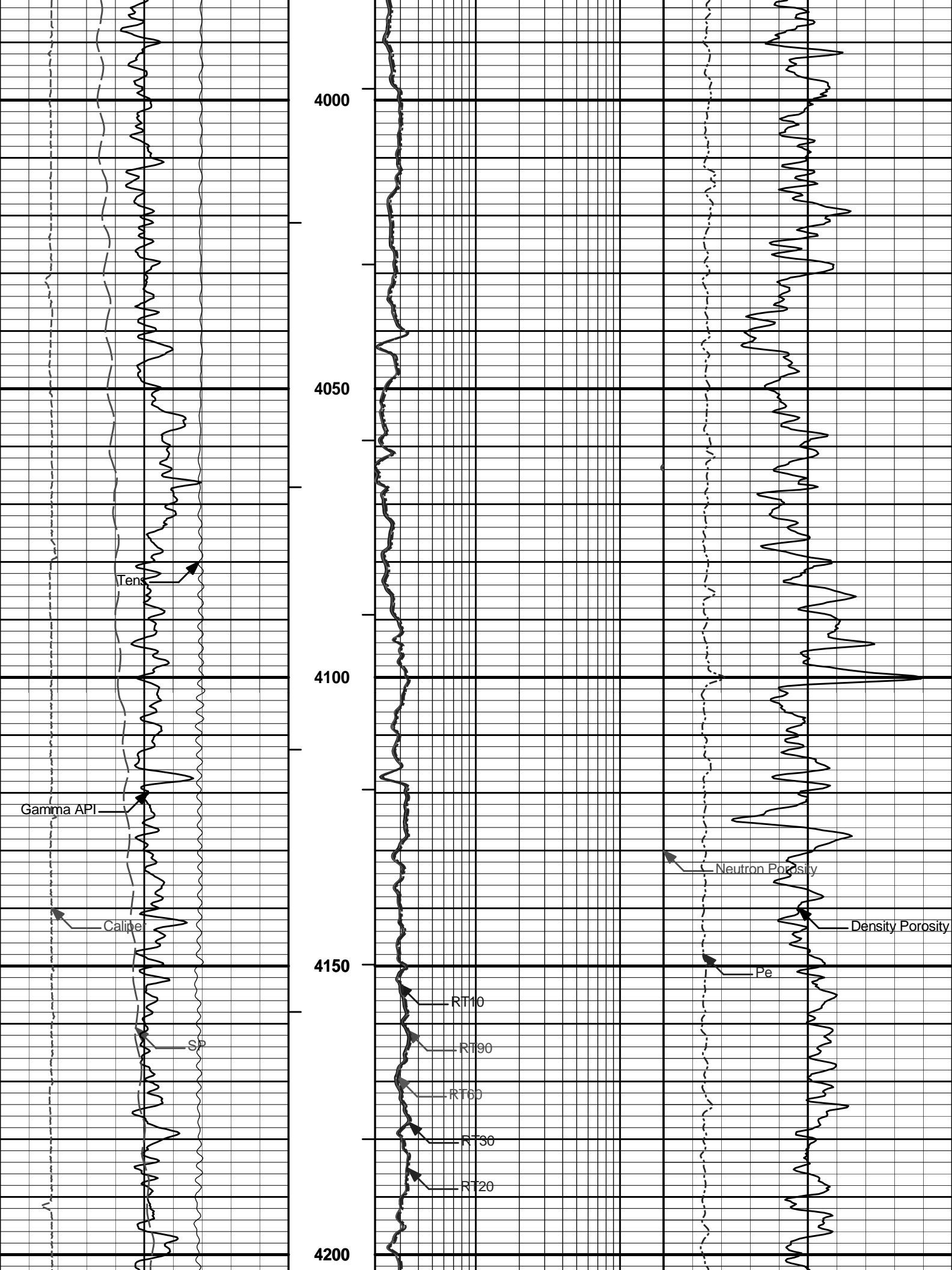
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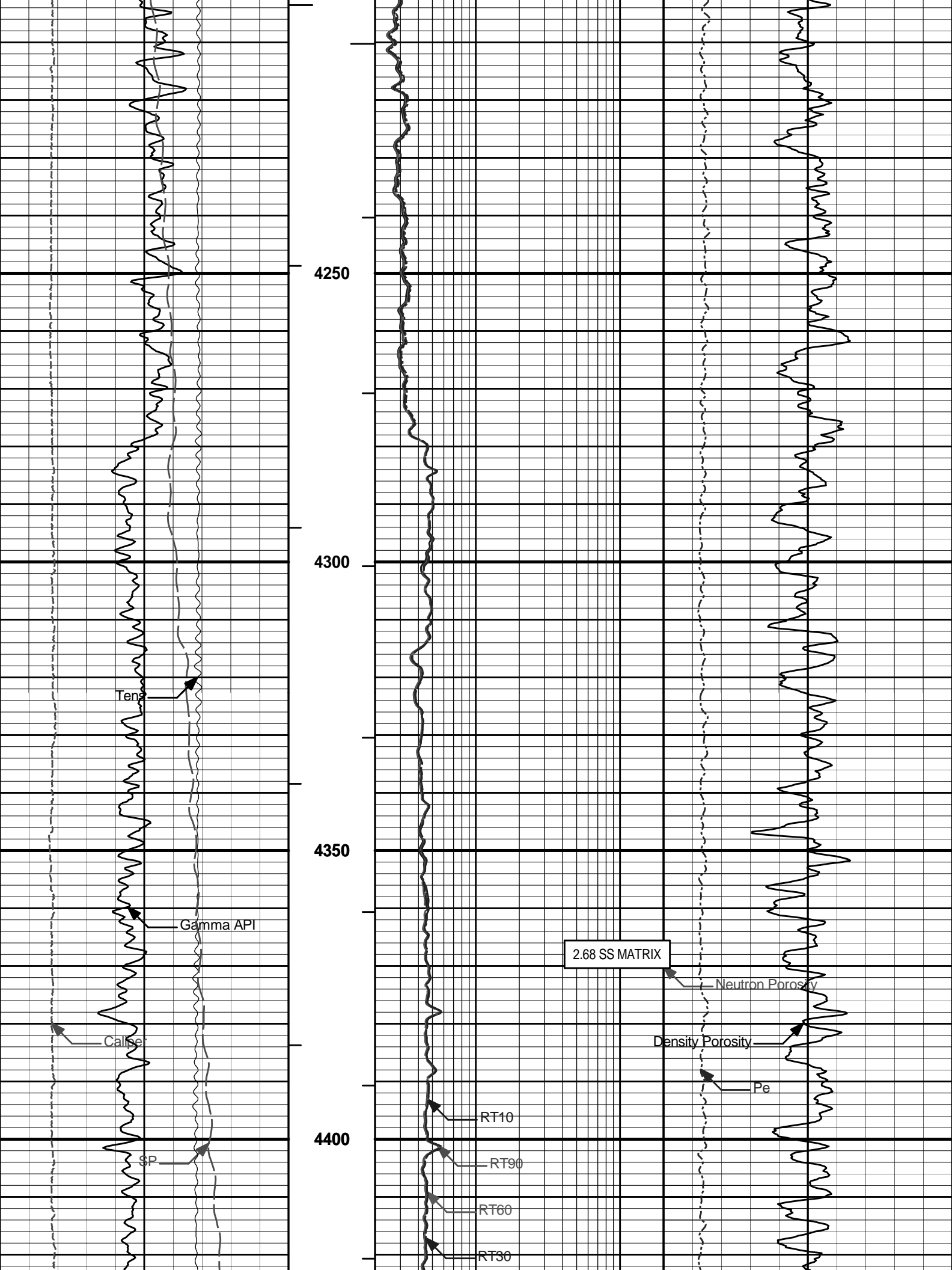


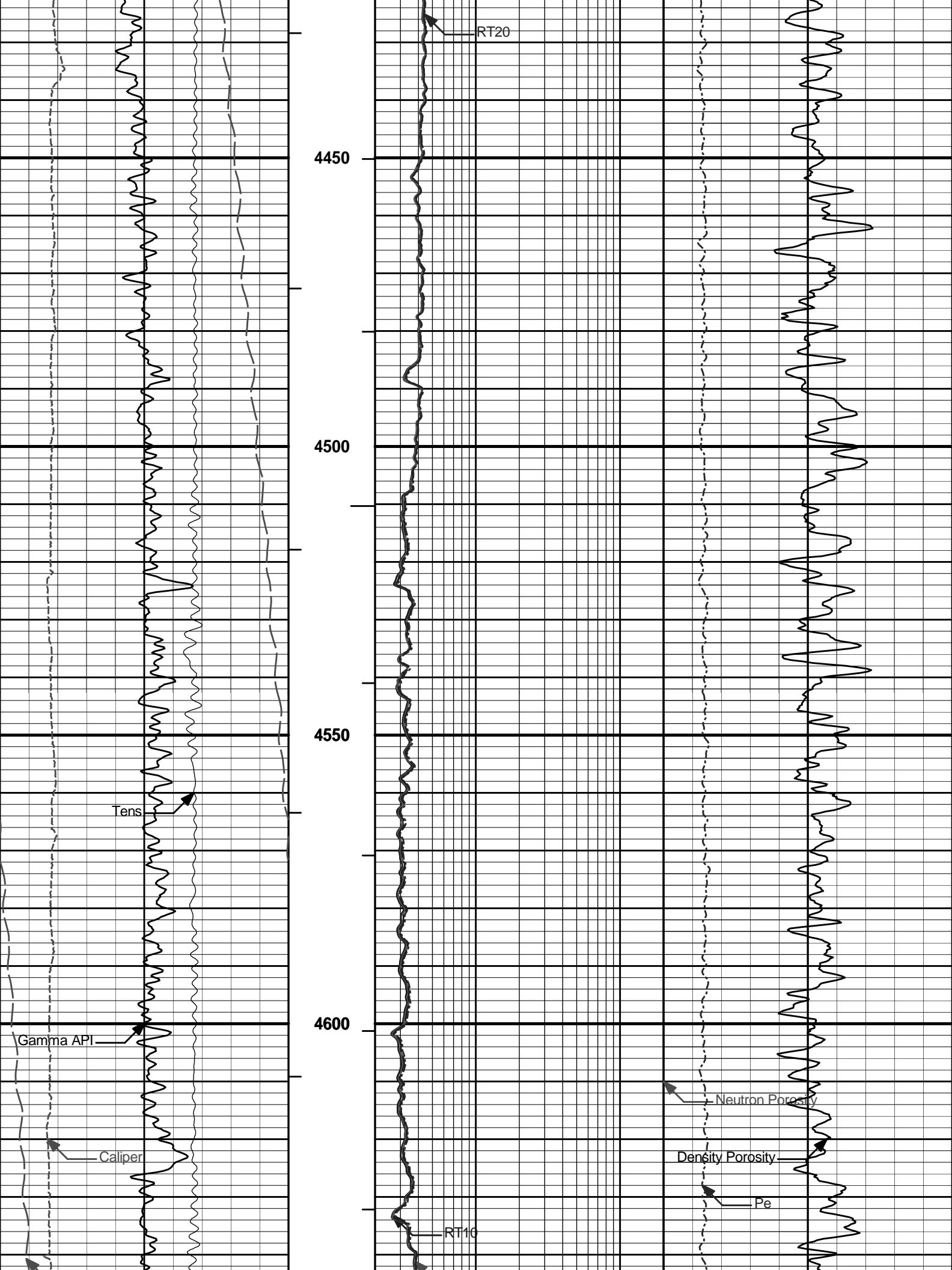


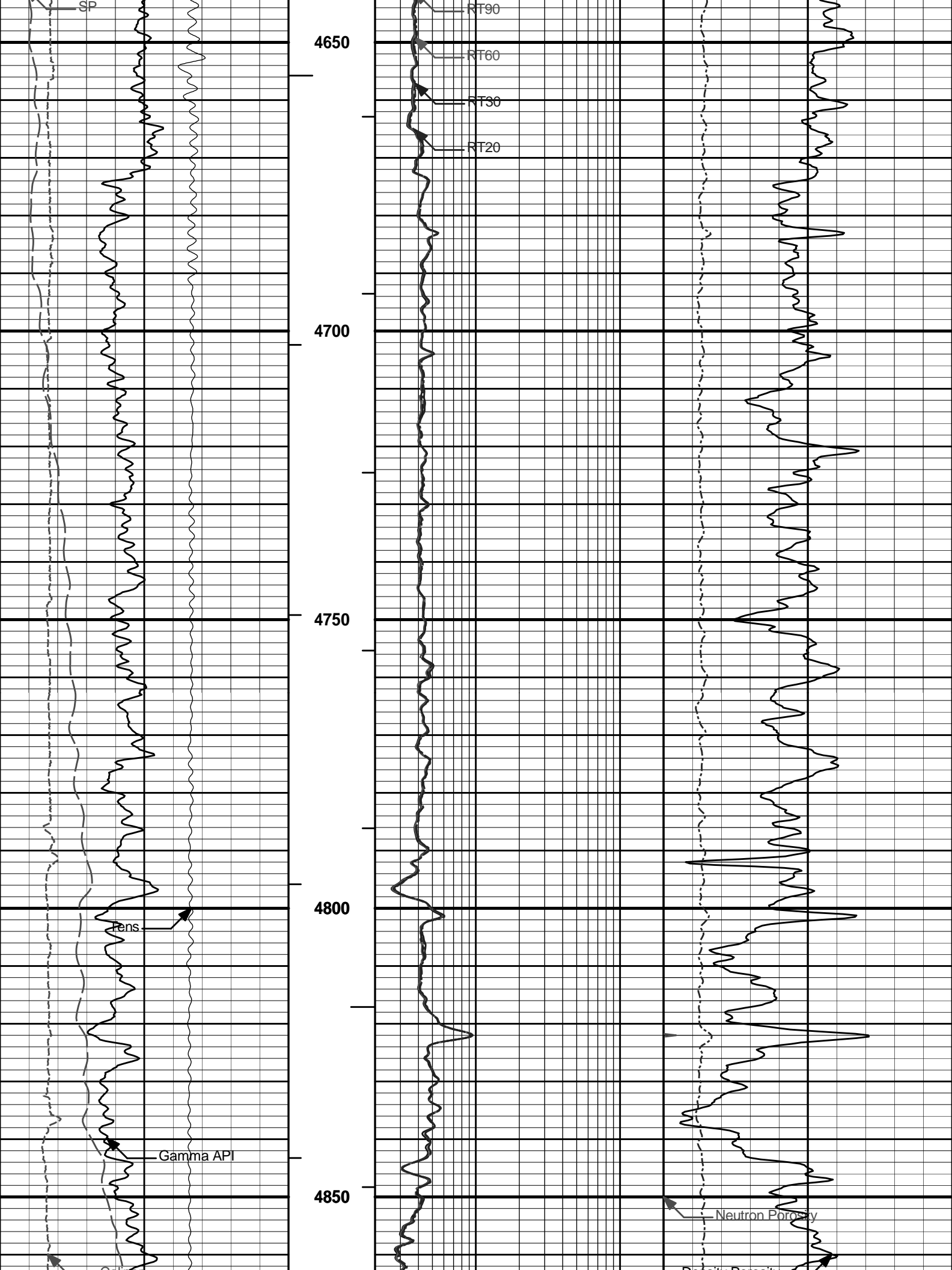


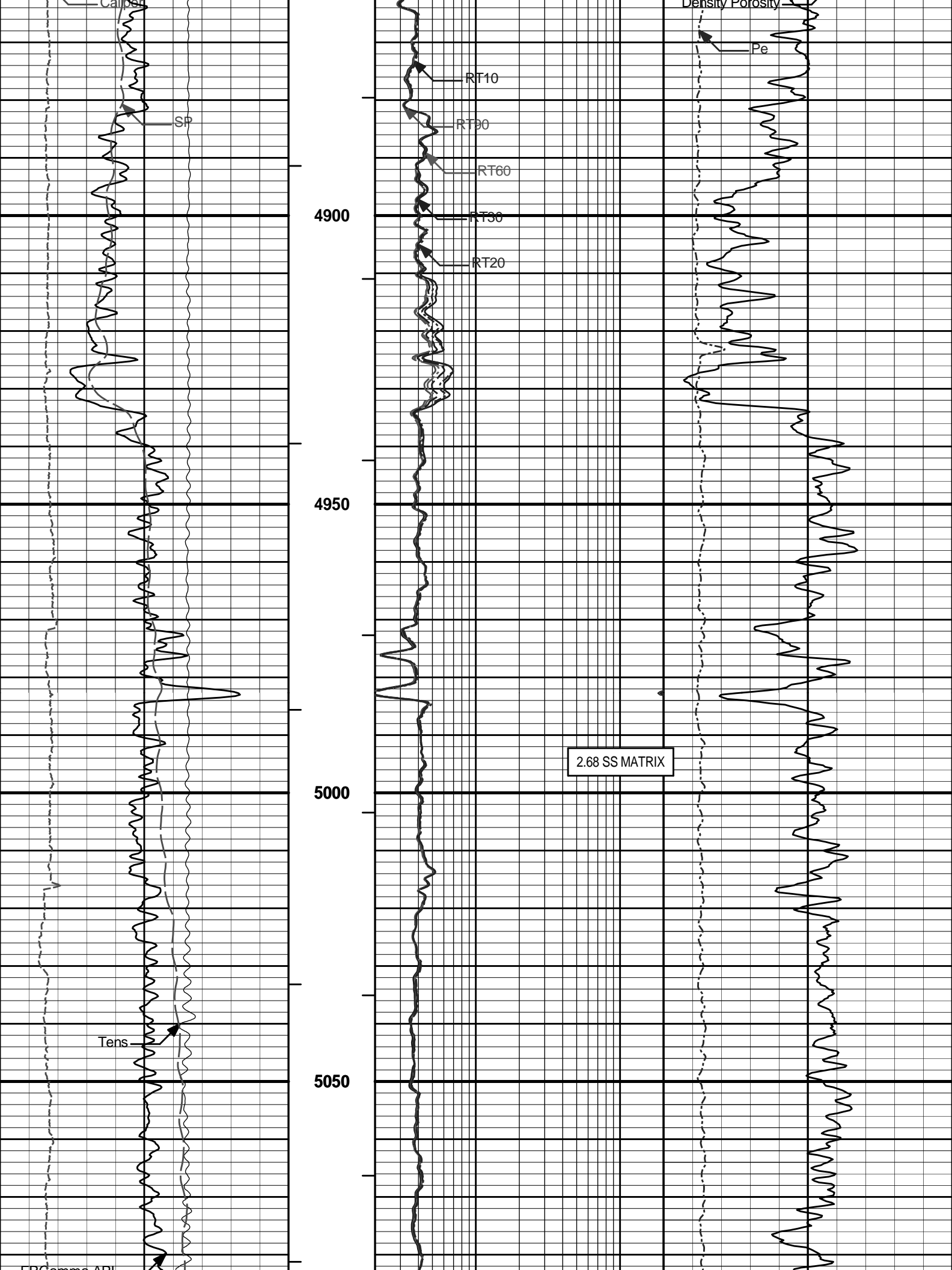


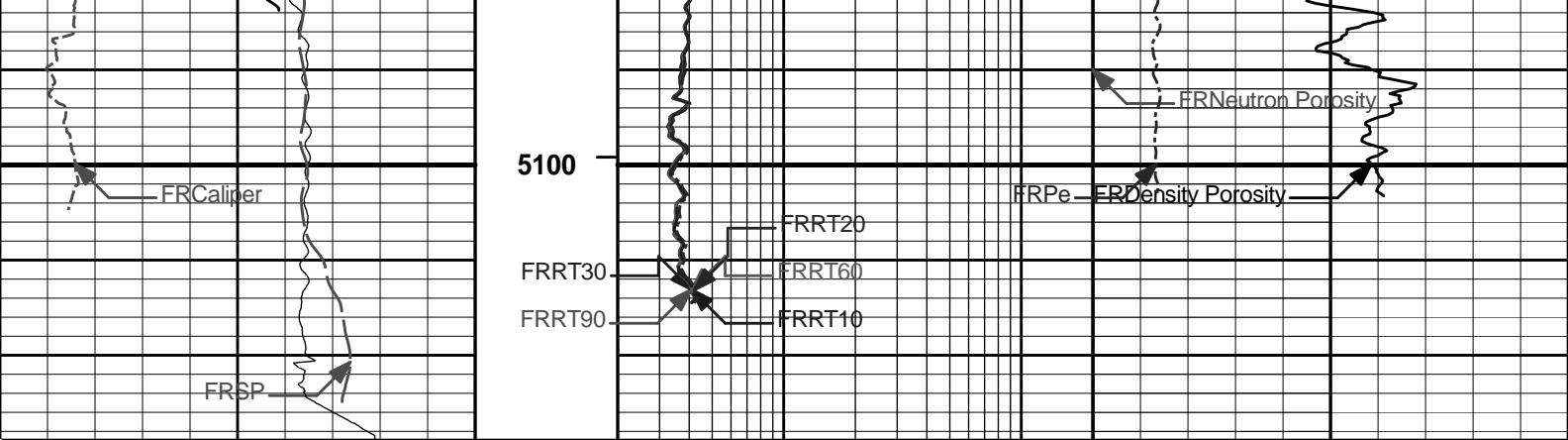












0	SP	100	1 : 240	2	RT90	200	0	Pe	10
	millivolts				Ohm-m				
0	Gamma API	250	BHVT	2	RT60	200	20	Density Porosity	0
	api				Ohm-m			percent	
6	Caliper	16	AHVT	2	RT30	200	20	Neutron Porosity	0
	inches				Ohm-m			percent	
10K	Tens	0		2	RT20	200			
	pounds				Ohm-m				
				2	RT10	200			
					Ohm-m				

HALLIBURTON	Plot Time: 20-Apr-11 13:24:26 Plot Range: 1125 ft to 5128.92 ft Data: {ActiveWell}\Well Based\MAIN* Plot File: \COMP\MAIN
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MAIN PASS 5" = 100'

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION			
Tool Name:	GTET - 11294346_RED	Reference Calibration Date:	24-Jan-11 09:38:13
Engineer:	C. GULLETT	Calibration Date:	10-Mar-11 16:03:18
Software Version:	WL INSITE R3.2.3 (Build 5)	Calibration Version:	1
Calibrator Source S/N: TB 289 Calibrator API Reference: 264.00 api Equivalent Calibrator API Reference: 268.6 api			
Measurement	Measured	Calibrated	Units
Background	76.8	80.0	api
Background + Calibrator	334.6	348.6	api
Calibrator	271.9	268.6	api

DUAL SPACED NEUTRON SHOP CALIBRATION			
Tool Name:	DSNT - PROT01	Reference Calibration Date:	01-Jan-70 00:00:00
Engineer:	E. LODER	Calibration Date:	18-Mar-11 16:18:56

Logging Source S/N: DSN-434
Tank Serial Number: 11068236
Reference value assigned to Tank: 53.720
Snow Block S/N: BRIGHTON
Calibration Tank Water Temperature: 60 degF
Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.967	0.967	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):	0.2223	0.2223	0.0000	+/- 0.0020
Calibrated Ratio:	10.11	10.11	0.000	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0723	0.02000 - 0.09000

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

SPECTRAL DENSITY SHOP CALIBRATION			
Tool Name:	SDLT - M271_P123_RED	Reference Calibration Date:	01-Jan-70 00:00:00
Engineer:	C. GULLETT	Calibration Date:	07-Apr-11 11:14:21
Software Version:	WL INSITE R3.2.3 (Build 5)	Calibration Version:	1

Logging Source S/N: 2770GW

Aluminum Block S/N: BRIGHTON_AL

Magnesium Block S/N: BRIGHTON_MG

Density: 2.600g/cc

Density: 1.680g/cc

Pe: 3.100

Pe: 2.594

DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0184	1.0184	0.90 - 1.10
Near Dens Gain	1.0043	1.0043	0.90 - 1.10
Near Peak Gain	0.9977	0.9977	0.90 - 1.10
Near Lith Gain	0.9868	0.9868	0.90 - 1.10
Far Bar Gain	1.0167	1.0167	0.90 - 1.10
Far Dens Gain	1.0041	1.0041	0.90 - 1.10
Far Peak Gain	0.9981	0.9981	0.90 - 1.10
Far Lith Gain	0.9686	0.9686	0.90 - 1.10
Near Bar Offset	0.1167	0.1167	NONE
Near Dens Offset	0.2263	0.2263	NONE
Near Peak Offset	0.3095	0.3095	NONE
Near Lith Offset	0.3948	0.3948	NONE
Far Bar Offset	0.0527	0.0527	NONE
Far Dens Offset	0.1247	0.1247	NONE

Far Dens Offset	0.1347	0.1347	NONE
Far Peak Offset	0.1644	0.1644	NONE
Far Lith Offset	0.3614	0.3614	NONE
Near Bar Background	851.77	851.77	700 - 1450
Near Dens Background	281.54	281.54	230 - 480
Near Peak Background	120.33	120.33	100 - 210
Near Lith Background	150.02	150.02	125 - 260
Far Bar Background	540.70	540.70	450 - 900
Far Dens Background	207.93	207.93	175 - 345
Far Peak Background	81.00	81.00	70 - 140
Far Lith Background	85.36	85.36	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.680	1.680	0.000	+/- 0.015
Pe	2.553	2.553	0.000	+/- 0.150
ALUMINUM				
Density (g/cc)	2.600	2.600	0.000	+/- 0.01500
Pe	3.061	3.061	0.000	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0012	+/- 0.0110	-0.0003	+/- 0.0140
Magnesium Block	-0.0006	+/- 0.0110	-0.0022	+/- 0.0140
Aluminum Block	-0.0002	+/- 0.0110	-0.0010	+/- 0.0140
Resolution	9.45	6.00 - 11.50	9.74	6.00 - 11.50
Internal Verifier(B+D+P+L)	1404	1200 - 2700	915	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

MICRO LOG SHOP CALIBRATION

Tool Name:	SDLT - M271_P123_RED	Reference Calibration Date:	15-Mar-11 14:02:09
Engineer:	C. GULLETT	Calibration Date:	07-Apr-11 11:38:32
Software Version:	WL INSITE R3.2.3 (Build 5)	Calibration Version:	1

CALIBRATION COEFFICIENT SUMMARY					
Measurement	Micro Log Normal		Micro Log Lateral		Units
	Measured	Calibrated	Measured	Calibrated	
Tool Zero	-0.08	-0.06	-0.01	-0.01	ohmm
Calibration Point #1	0.01	0.00	0.00	0.00	ohmm

Calibration Point #1	-0.01	0.00	-0.00	0.00	ohmm
Calibration Point #2	20.03	20.00	20.03	20.00	ohmm
Internal Reference	19.94	19.91	20.02	20.00	ohmm

Measurement	Micro Log Normal Tool Value	Micro Log Lateral Tool Value	Units
Tool Zero	2.60	-2.63	V
Calibration Point #1	19.16	1.01	V
Calibration Point #2	5253.32	6838.23	V
Internal Reference	5230.38	6836.61	V

DENSITY CALIPER SHOP CALIBRATION

Tool Name:	SDLT - M271_P123_RED	Reference Calibration Date:	10-Mar-11 14:28:07
Engineer:	C. GULLETT	Calibration Date:	07-Apr-11 11:34:36
Software Version:	WL INSITE R3.2.3 (Build 5)	Calibration Version:	1

CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-1137.93	-1312.99	-7000.00 - -1000.00
Pad Gain	0.0003737	0.0003906	0.000200 - 0.000600
Arm Offset	-342.28	-182.14	-5000.00 - 3000.00
Arm Gain	0.0004999	0.0005088	0.000300 - 0.000700
Arm Power	-0.000003798	-0.000004888	-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)	1.98	2.00	0.02	+/- 0.20
Medium Ring (in)	3.65	3.75	0.10	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.46	6.50	0.04	+/- 0.20
Medium Ring (in)	8.20	8.25	0.05	+/- 0.20
Large Ring (in)	15.11	15.00	-0.11	+/- 0.20

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

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name:	ACRt - E2817-S4353_RED	Reference Calibration Date:	13-Aug-10 20:06:47
Engineer:	F. LODER	Calibration Date:	30-Mar-11 18:36:19
Software Version:	WL INSITE R3.2.3 (Build 5)	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	1.0059	1.05	0.95	1.0075	1.05	0.95	1.0051	1.05
A2 (50")	0.95	1.0076	1.05	0.95	1.0107	1.05	0.95	1.0110	1.05
A3 (29")	0.95	1.0065	1.05	0.95	1.0088	1.05	0.95	1.0066	1.05
A4 (17")	0.95	1.0010	1.05	0.95	1.0019	1.05	0.95	1.0026	1.05
A5 (10")	N/A	N/A	N/A	0.95	0.9944	1.05	0.95	0.9939	1.05

A3 (10")	N/A	N/A	N/A	0.95	0.9944	1.05	0.95	0.9930	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9793	1.05	0.95	0.9785	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	-1.036	2	-6	-4.390	-2	-8	-4.791	-2
A2 (50")	-7	-1.751	-1	-6	-2.896	-2	-7	-4.731	-2
A3 (29")	-27	-12.778	-9	-9	-3.452	-3	-7	-3.636	-1
A4 (17")	-180	-88.705	-60	-45	-28.593	-15	-39	-24.648	-13
A5 (10")	N/A	N/A	N/A	-150	-91.844	-50	-80	-44.230	-10
A6 (6")	N/A	N/A	N/A	175	331.191	525	90	166.676	270


TRANSMITTER CURRENT GAIN					R-MUD VERIFICATION			
Signal	Lower	R	Upper		Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
12K	0.6	0.8814	1.3		Mud Cell	0.95	0.997	1.05
36K	1.0	1.8411	2.0					
72K	1.0	1.1239	2.0					

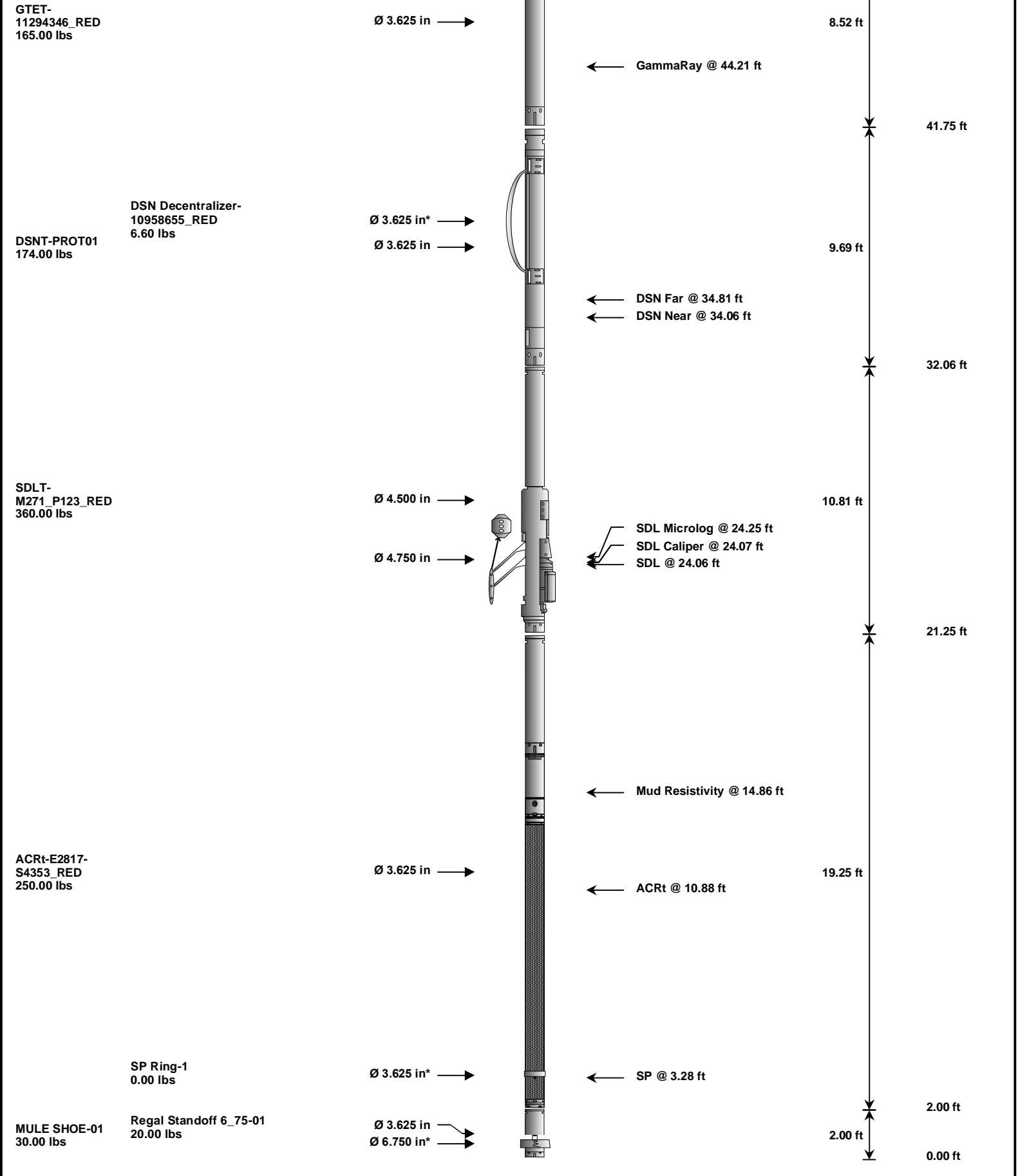
CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11294346_RED						
Gamma Ray Calibrator	268.6	-----	-----	0.0	+/- 9.00	api
DSNT-PROT01						
Snow-Block Porosity	0.0723	-----	-----	0.0000	+/- -.--	decp
SDLT-M271_P123_RED						
Near(B+D+P+L)	1403.665	-----	-----	0.000	+/-13.236	cps
Far(B+D+P+L)	914.985	-----	-----	0.000	+/-14.879	cps
MicroLog Normal	19.91	-----	-----	0.00	-----	ohmm
MicroLog Lateral	20.00	-----	-----	0.00	-----	ohmm
Pad Extension	3.75	-----	-----	0.00	+/-0.20	in
Ring Diameter	8.25	-----	-----	0.00	+/-0.20	in
ACRt-E2817-S4353_RED						
Mud Cell	0.997	-----	-----	0.000	-----	ohm-m

Data: BADDING_14_35SX\0001 TRIPLE\IDLE	Date: 10-Apr-11 20:08:46
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HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
RWCH-B097 135.00 lbs		Ø 3.625 in →	 <div> <div>← Load Cell @ 52.84 ft</div> <div>← BH Temperature @ 52.27 ft</div> </div>		<div>6.25 ft</div> <div>50.27 ft</div>	56.52 ft



Mnemonic		Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head		B097	135.00	6.25	50.27	300.00
GTET	Gamma Telemetry Tool		11294346_RED	165.00	8.52	41.75	60.00
DSNT	Dual Spaced Neutron		PROT01	174.00	9.69	32.06	60.00
DCNT	DSN Decentralizer		10958655_RED	6.60	5.13	*	35.39
SDLT	Spectral Density Tool		M271_P123_RED	360.00	10.81	21.25	60.00
ACRt	Array Compensated True Resistivity		E2817-S4353_RED	250.00	19.25	2.00	300.00
SP	SP Ring		1	0.00	0.25	*	3.28

CP	CP Ring	1	0.00	0.25	0.25	000.00
M S	MULE SHOE	01	30.00	2.00	0.00	100.00
RSOF	Regal Standoff 6.75in	01	20.00	0.52	*	0.39 300.00
Total			1,140.60	56.52		
			* Not included in Total Length and Length Accumulation.			
Data: BADDING_14_35SX\0001 TRIPLEVDLE			Date: 10-Apr-11 18:35:21			

COMPANY	KERR-MCGEE OIL & GAS ONSHORE LP		
WELL	BADDING 14-35SX		
FIELD	WATTENBERG		
COUNTY	WELD	STATE	CO
HALLIBURTON		SPECTRAL DENSITY DUAL SPACED NEUTRON ARRAY COMPENSATED TURE RESISTIVITY	