

HALLIBURTON

DUAL LATEROLOG
MICRO-SPHERICALLY FOCUSED
DUAL SPACED NEUTRON
SPECTRAL DENSITY
BOREHOLE SONIC LOG

COMPANY		CHAMA OIL & MINERALS LLC	
WELL		SORS-1P	
FIELD/BLOCK		WILDCAT	
COUNTY		WASHINGTON	
STATE		CO	
Permanent Datum		GL	
Log measured from		KB	
Drilling measured from		KB	
Date	08-Jan-13		
Run No.	1		
Depth - Driller	6385.00 ft		
Depth - Logger	6366.0 ft		
Bottom - Logged Interval	6363.0 ft		
Top - Logged Interval	547.0 ft		
Casing - Driller	13.375 in @ 550.0 ft		
Casing - Logger	547.0 ft		
Bit Size	12.250 in		
Type Fluid in Hole	WATER BASED MUD		
Density	10.5 ppg	47.00 s/qt	
PH	10.50 pH	5.8 cphm	
Source of Sample	FLOWLINE		
Rm @ Meas. Temperature	0.069 ohmm @ 36.00 degF	@	@
Rmf @ Meas. Temperature	0.02 ohmm @ 75.00 degF	@	@
Rmc @ Meas. Temperature	0.065 ohmm @ 75.00 degF	@	@
Source Rmf	CHART	CHART	
Rm @ BHT	0.02 ohmm @ 179.0 degF	@	@
Time Since Circulation	10.0 hr		
Time on Bottom	08-Jan-13 05:58		
Max. Rec. Temperature	179.0 degF @ 6366.0 ft	@	@
Equipment	11072147	BRIGHTON	
Recorded By	J. WALDEN		
Witnessed By	LARRY KEITH		

COMPANY	CHAMA OIL & MINERALS LLC
WELL	SORS-1P
FIELD/BLOCK	WILDCAT
COUNTY	WASHINGTON
STATE	CO
API No.	05121110180000
Location	LATITUDE: 40.279391° LONGITUDE: -103.394496° SHL: 650' FSL & 650' FWL SMSW
Other Services:	RWCH

Sect.	26	Twp.	4N	Rge.	54W
Elev.	4412.5 ft	D.F.	4434.6 ft	G.L.	4412.5 ft

Fold here

Service Ticket No.:				API Serial No.: 05121110180000				PGM Version: WL INSITE R3.8.0 (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	DLLT	N/A	ECCE.	N/A		
Rmc @ Meas. Temp.						@		@		90277021					
Source Rmf	Rmc					ONE	MSFL	STAN.	ECCE.	N/A					
Rm @ BHT						@		@		11976327					
Rmf @ BHT						@		@							
Rmc @ BHT						@		@							
EQUIPMENT DATA															
GAMMA				ACOUSTIC				DENSITY				NEUTRON			
Run No.	ONE			Run No.	ONE			Run No.	ONE			Run No.	ONE		
Serial No.	11958944			Serial No.	11105780			Serial No.	11014271			Serial No.	11219332		
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.	GTET			Spacing	2'			Log Type	GAM-GAM			Log Type	NEU-NEU		
Type	SCINT							Source Type	CS137			Source Type	AM241BE		
Length	8"			LSA [Y/N]	N/A			Serial No.	5256GW			Serial No.	DSN430		
Distance to Source	14'			FWDA [Y/N]	N/A			Strength	1.78CI			Strength	15CI		
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	6366	CSG	REC	0	200	140	40	55.5	30	-10	2.68	30	10	SAND		
DIRECTIONAL INFORMATION																
Maximum Deviation								@	KOP							@
Remarks: RWCH-SP-GTET-DSNT-SDLT-BSAT-IDT-ICT-DLLT-MSFL RUN WITH TWO STANDOFFS FOR DLL AND TWO CENTRALIZERS FOR BSAT.																
WASHOUTS, BOREHOLE RUGOSITY, AND TIGHT PULLS MAY AFFECT LOG RESPONSE.																
YOUR CREW TODAY: A. AXE, M. BURNETT, C. KLEINSASSER.																
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES. BRIGHTON, CO.																
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																

HALLIBURTON

PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	BS	Bit Size	12.250	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	10.500	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	146000.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	0.069	ohmm
	SHARED	TRM	Temperature of Mud	36.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	9.625	in
	SHARED	ST	Surface Temperature	34.0	degF
	SHARED	TD	Total Well Depth	6366.00	ft
	SHARED	BHT	Bottom Hole Temperature	179.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	IDT	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	IDT	
	SHARED	TEMM	Temperature Master Tool	NONE	
	SHARED	BHSM	Borehole Size Master Tool	ICT	
	Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
	Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
	Rwa /	AEAC	Archie A factor	0.6200	

	CrossPlot	ARAC	Archie A factor	0.0200	
	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	
	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	
	DSNT	DNOK	Process DSN?	Yes	
	DSNT	DEOK	Process DSN EVR?	No	
	DSNT	NLIT	Neutron Lithology	Sandstone	
	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	
	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	2.680	g/cc
	SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
	BSAT	MBOK	Compute BCAS Results?	Yes	
	BSAT	FLLO	Frequency Filter Low Pass Value?	5000	Hz
	BSAT	FLHI	Frequency Filter High Pass Value?	27000	Hz
	BSAT	DTFL	Delta -T Fluid	189.00	uspf
	BSAT	DTMT	Delta -T Matrix Type	Sandstone 55.5	
	BSAT	DTSH	Delta -T Shale	100.00	uspf
	BSAT	SPEQ	Acoustic Porosity Equation	Wylie	
	IDT	WRTI	Survey Writing Interval	30	ft
	IDT	SOPT	Smoothing Option	None	
	ICT	CLOK	Process Caliper Outputs?	Yes	
	ICT	DARM	Disable Caliper Arm	No	
	ICT	ATDS	Arm To Disable	0	
	ICT	REPM	Method to replace arm?	Caliper Average	
	ICT	ARMV	Diameter to use for disabled arm	0.00	in
	ICT	DARM	Disable Second Caliper Arm	No	
	ICT	ATDS	Second Arm To Disable	0	
	ICT	REPM	Method to replace second arm?	Caliper Average	
	ICT	ARMV	Diameter to use for second disabled arm	0.00	in
	ICT	NAVS	Navigation Source Tool	IDT	
	ICT	CL1O	Radius 1 Offset	0.0	in
	ICT	CL2O	Radius 2 Offset	0.0	in
	ICT	CL3O	Radius 3 Offset	0.0	in
	ICT	CL4O	Radius 4 Offset	0.0	in
	ICT	CL5O	Radius 5 Offset	0.0	in
	ICT	CL6O	Radius 6 Offset	0.0	in
	ICT	BHVC	Radius type for borehole volume calcuations	Elliptical	
	ICT	BLOK	Radius type for borehole volume calcuations	Yes	

DLLT	DLOK	Process Dual Laterolog?	Yes
DLLT	DBOK	Process Dual Laterolog Borehole Corrections?	Yes
DLLT	SBHD	Select Borehole Diam Source	Caliper
DLLT	TPOS	Tool Position	Standoff
DLLT	TMPC	Temperature Correction Type	Tool Value
DLLT	DLOK	Calculate Dual Laterolog DI?	Yes
MSFL	DLOK	Process MSFL?	Yes
MSFL	SLPD	Use MSFL Slim Hole Pad?	No
MSFL	CLOK	Process Caliper Outputs?	Yes

BOTTOM

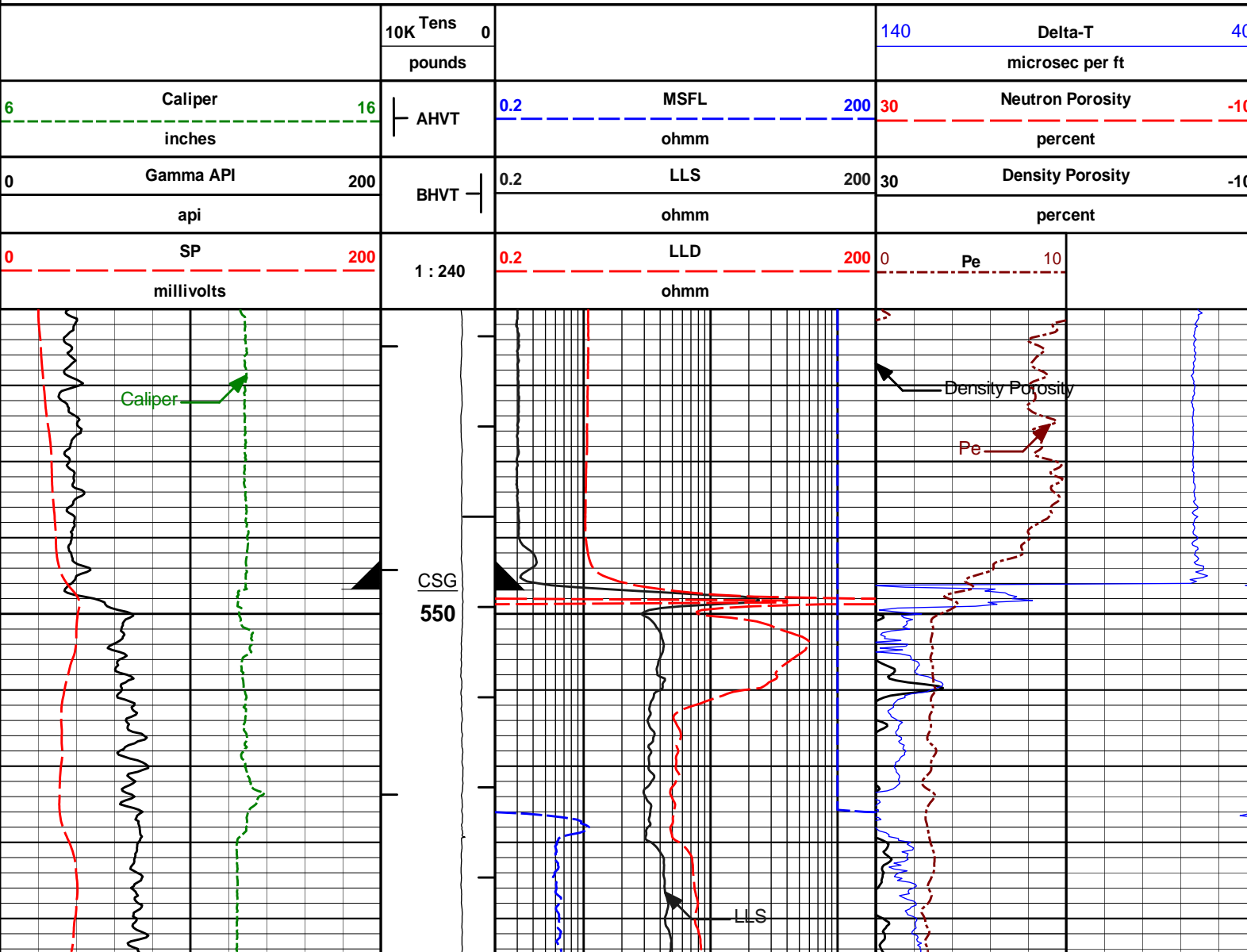
Data: SORS_1P\0002 GTET-DSNT-SDLT-BSAT-DLLT-MSFL\IDLE

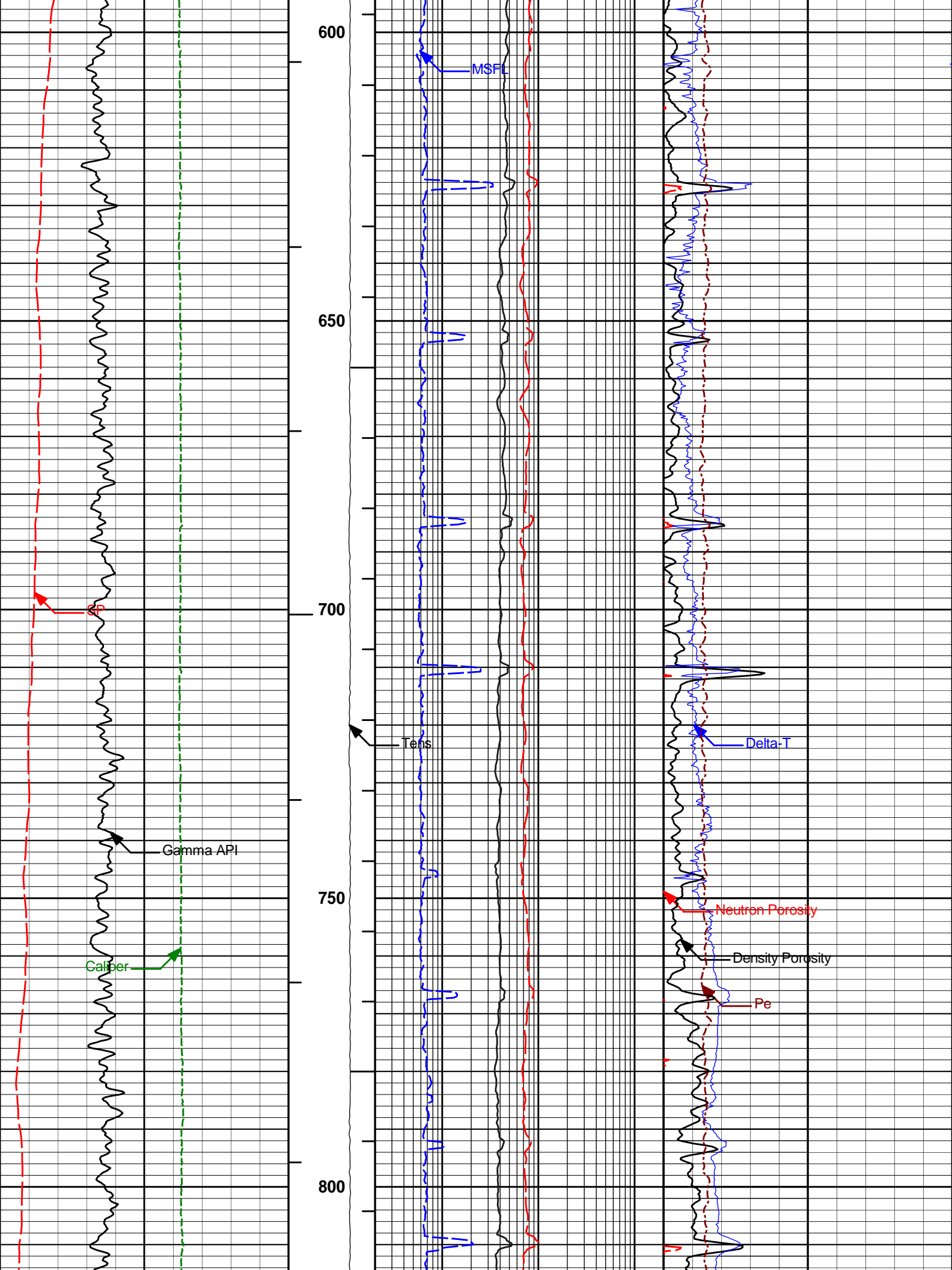
Date: 08-Jan-13 07:34:06

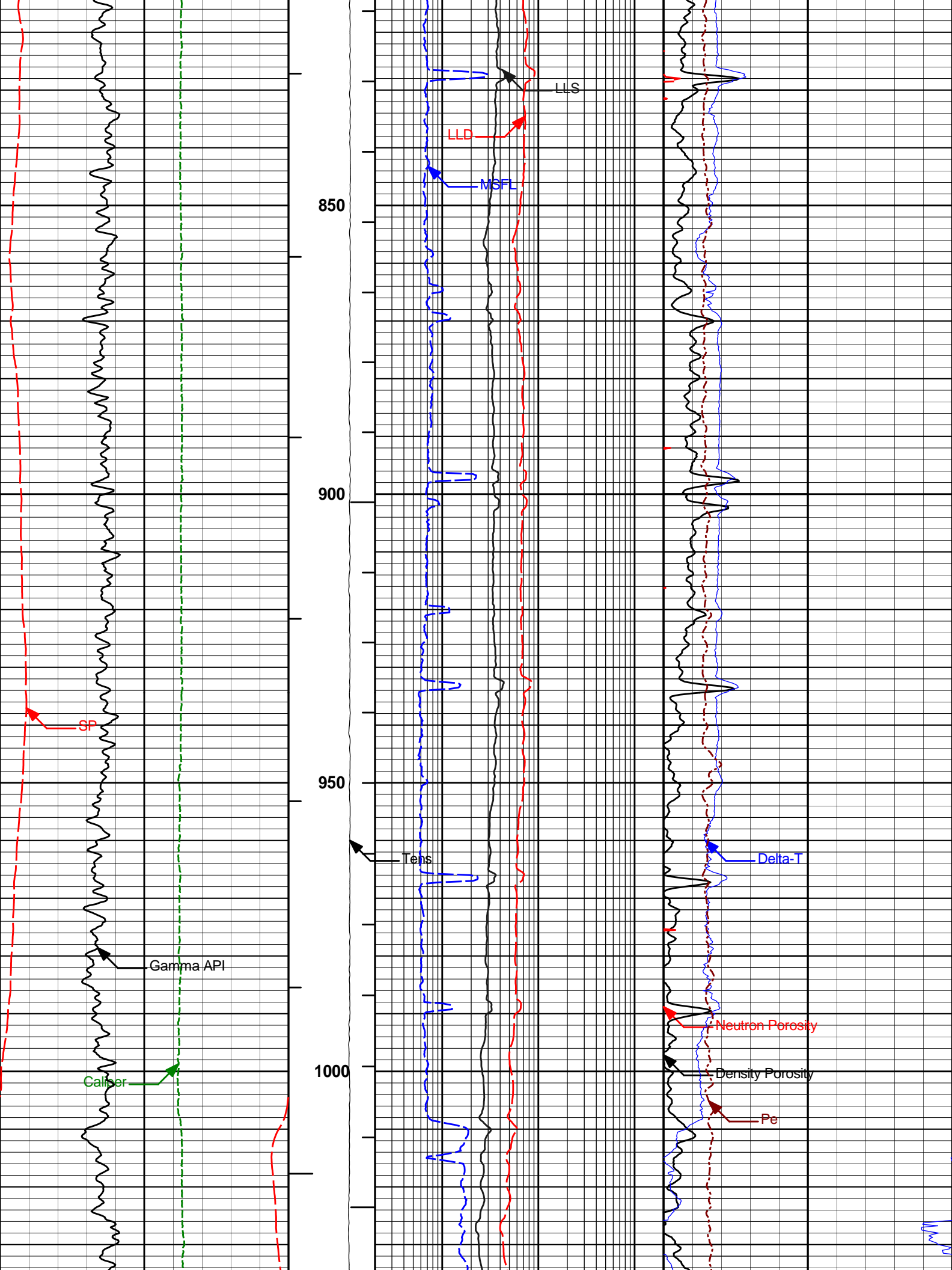
HALLIBURTON

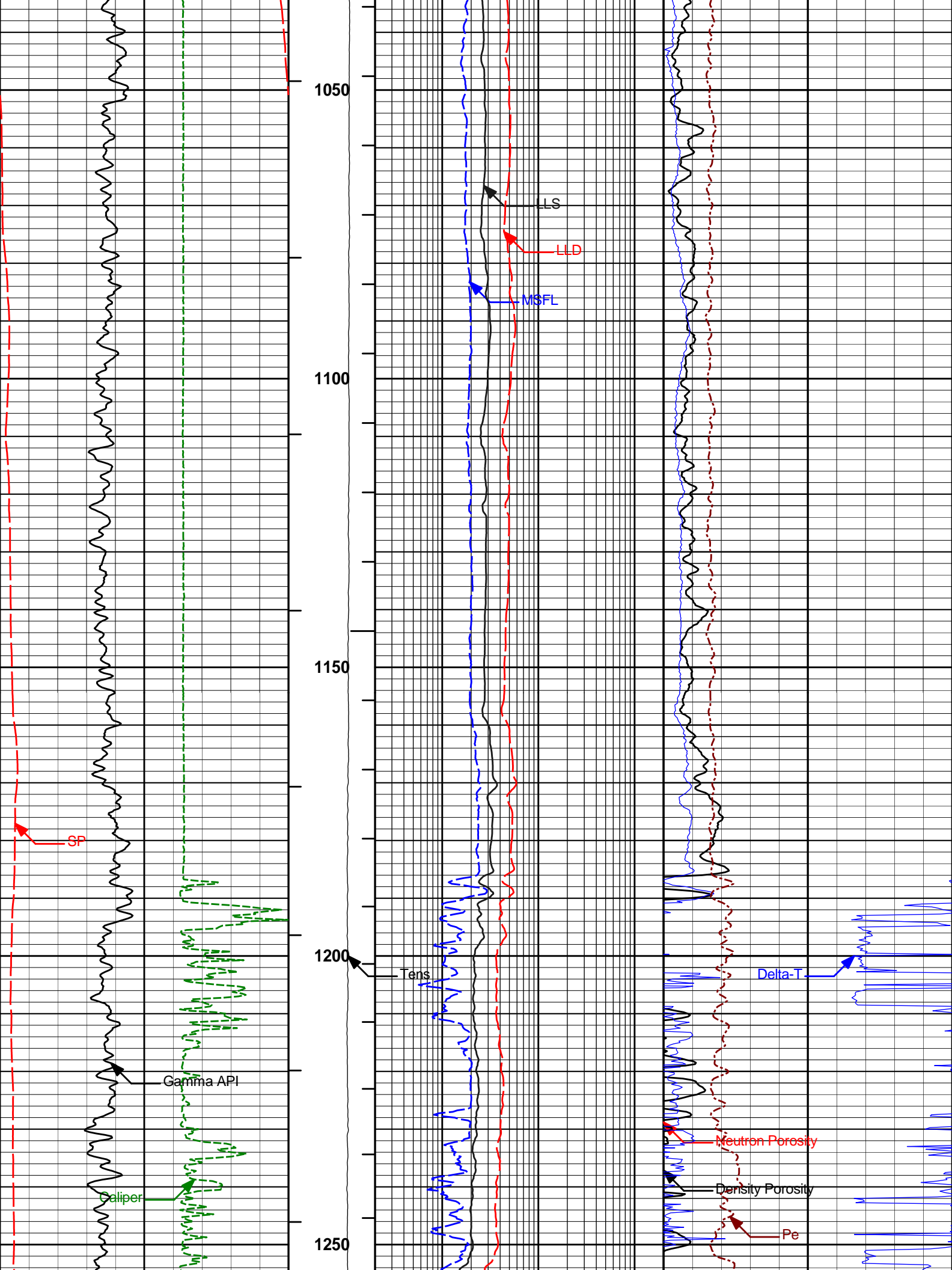
Plot Time: 08-Jan-13 08:57:34
 Plot Range: 510 ft to 6375 ft
 Data: SORS_1P\Well Based\DAQ-0002-002*
 Plot File: \COMP\MAIN

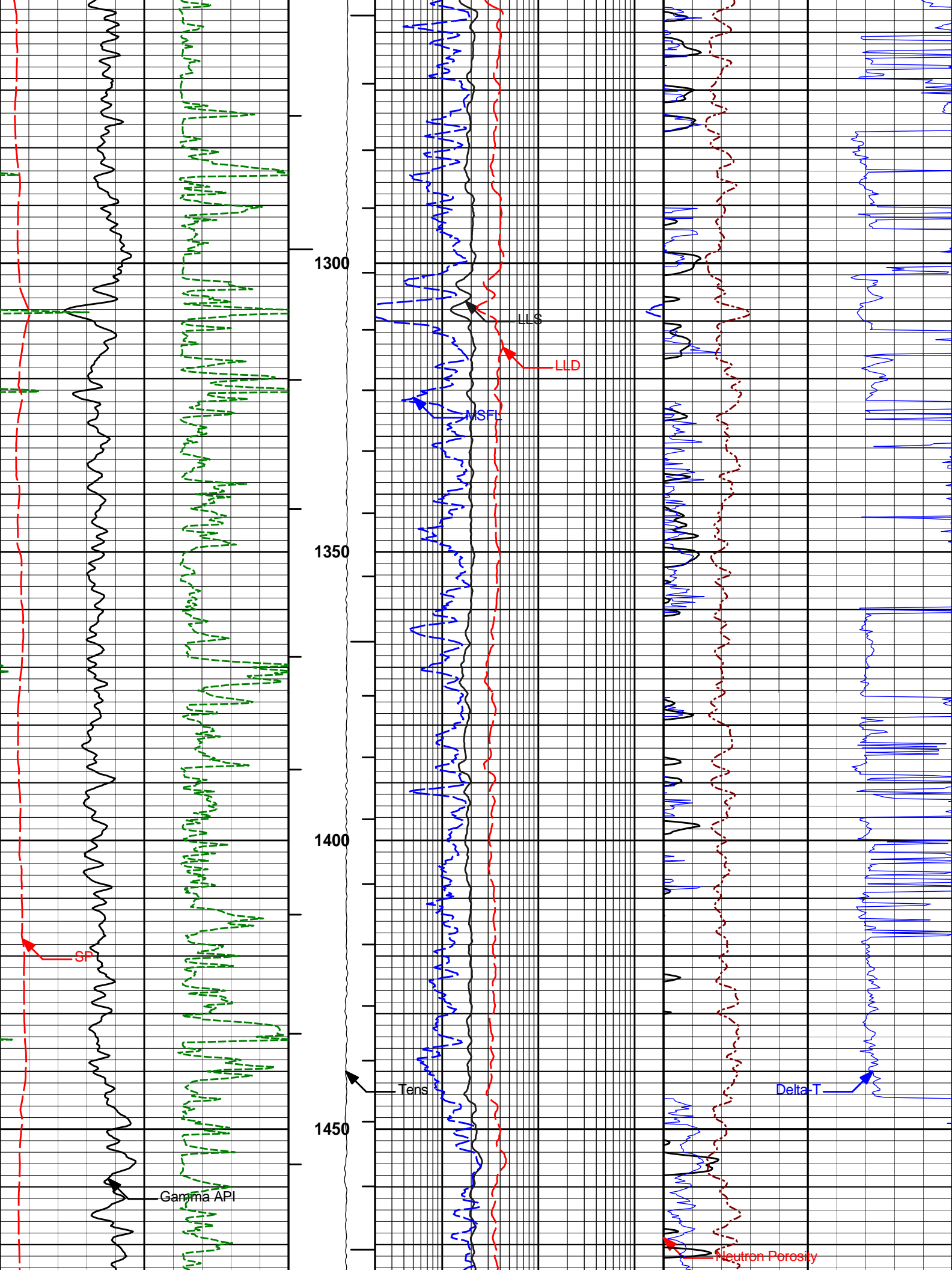
MAIN PASS 5" = 100'

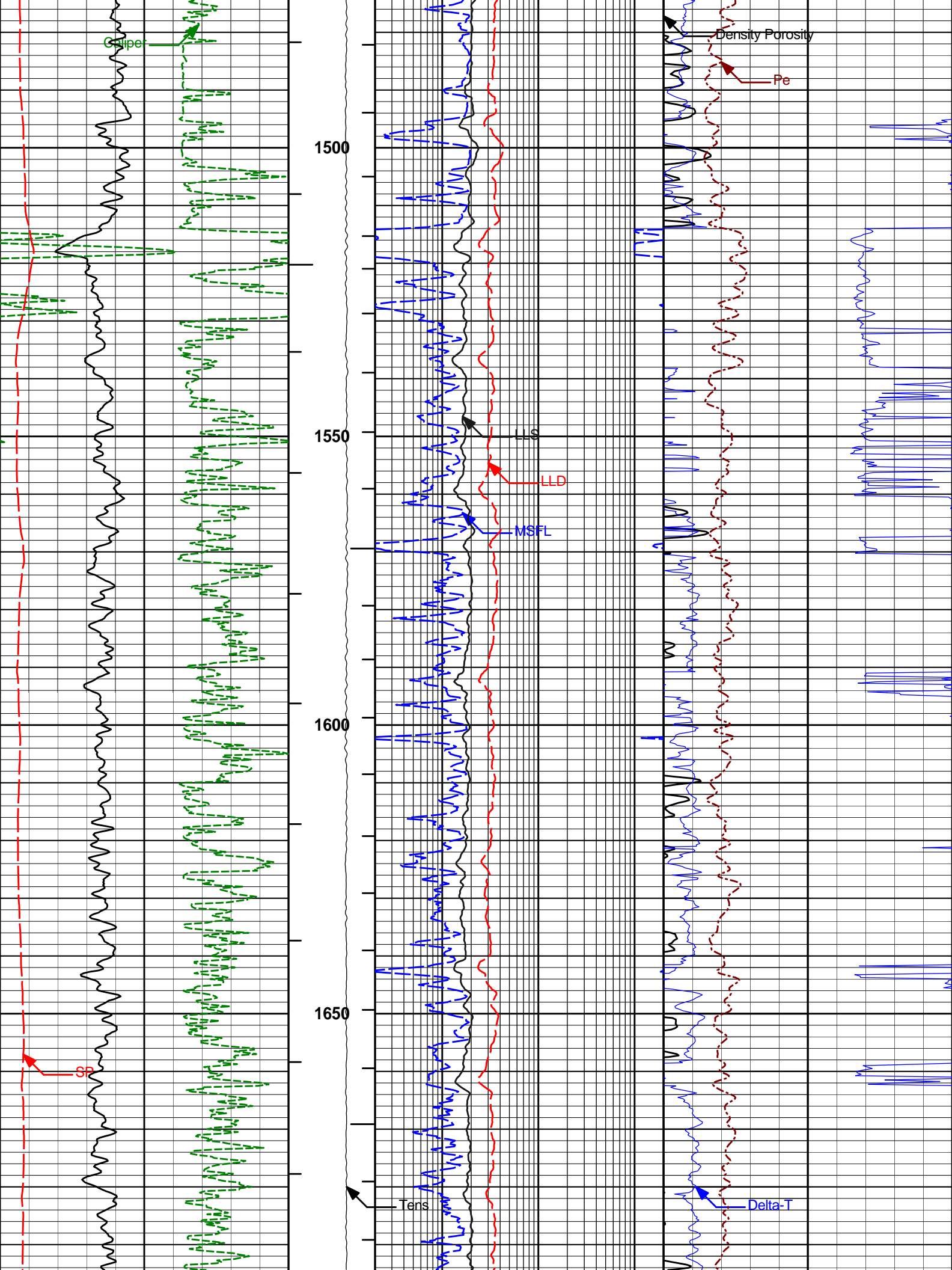


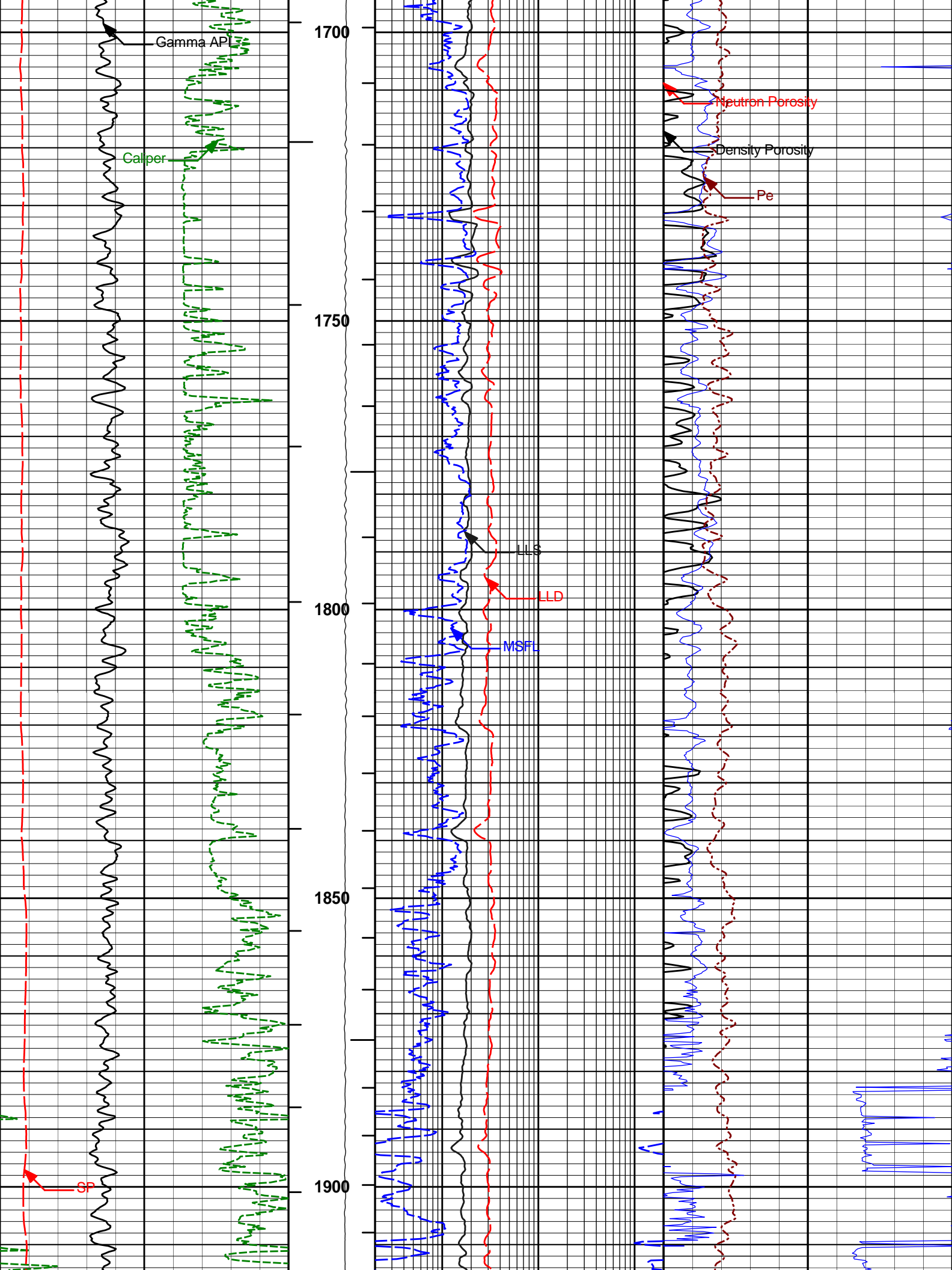


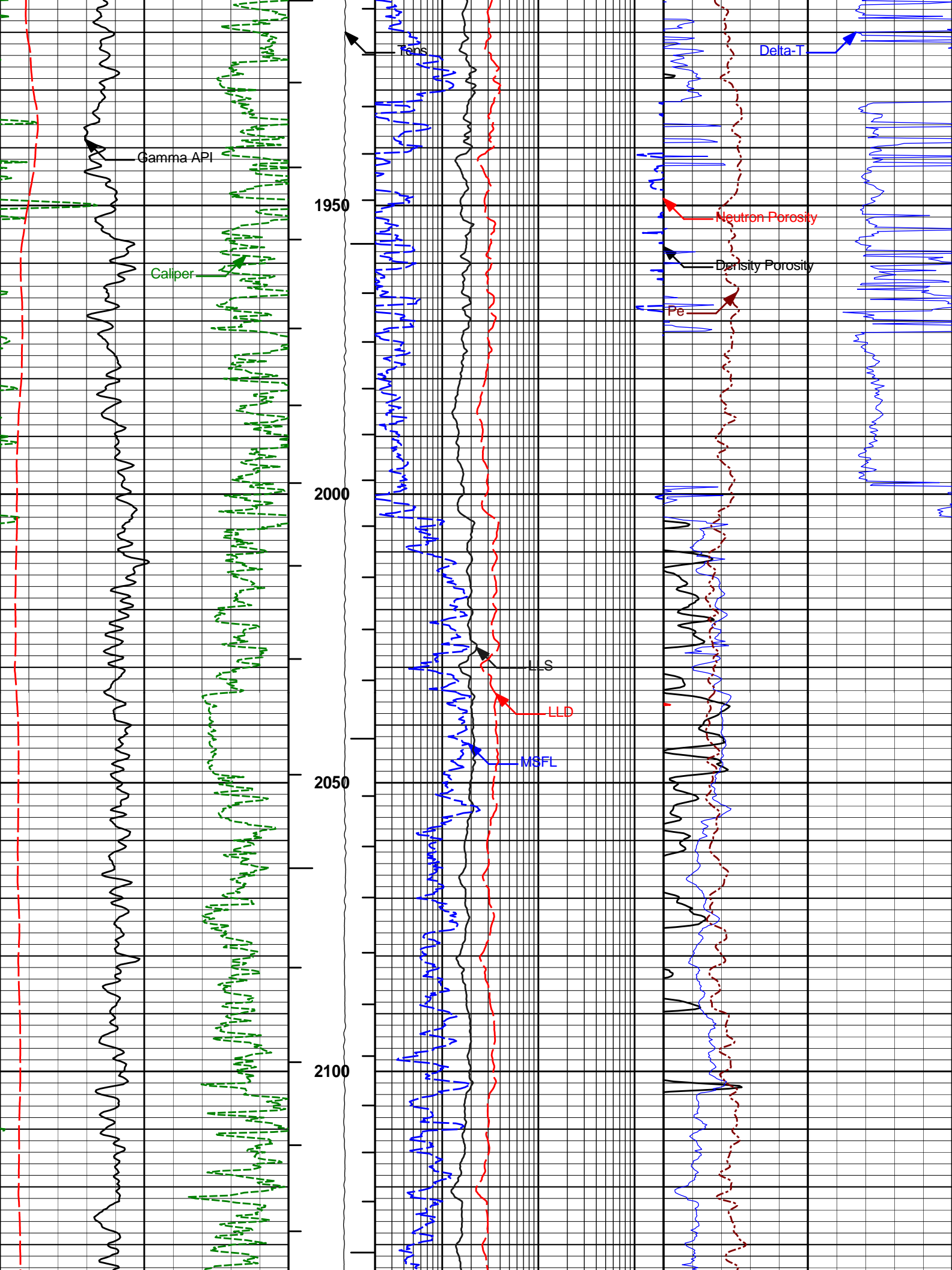


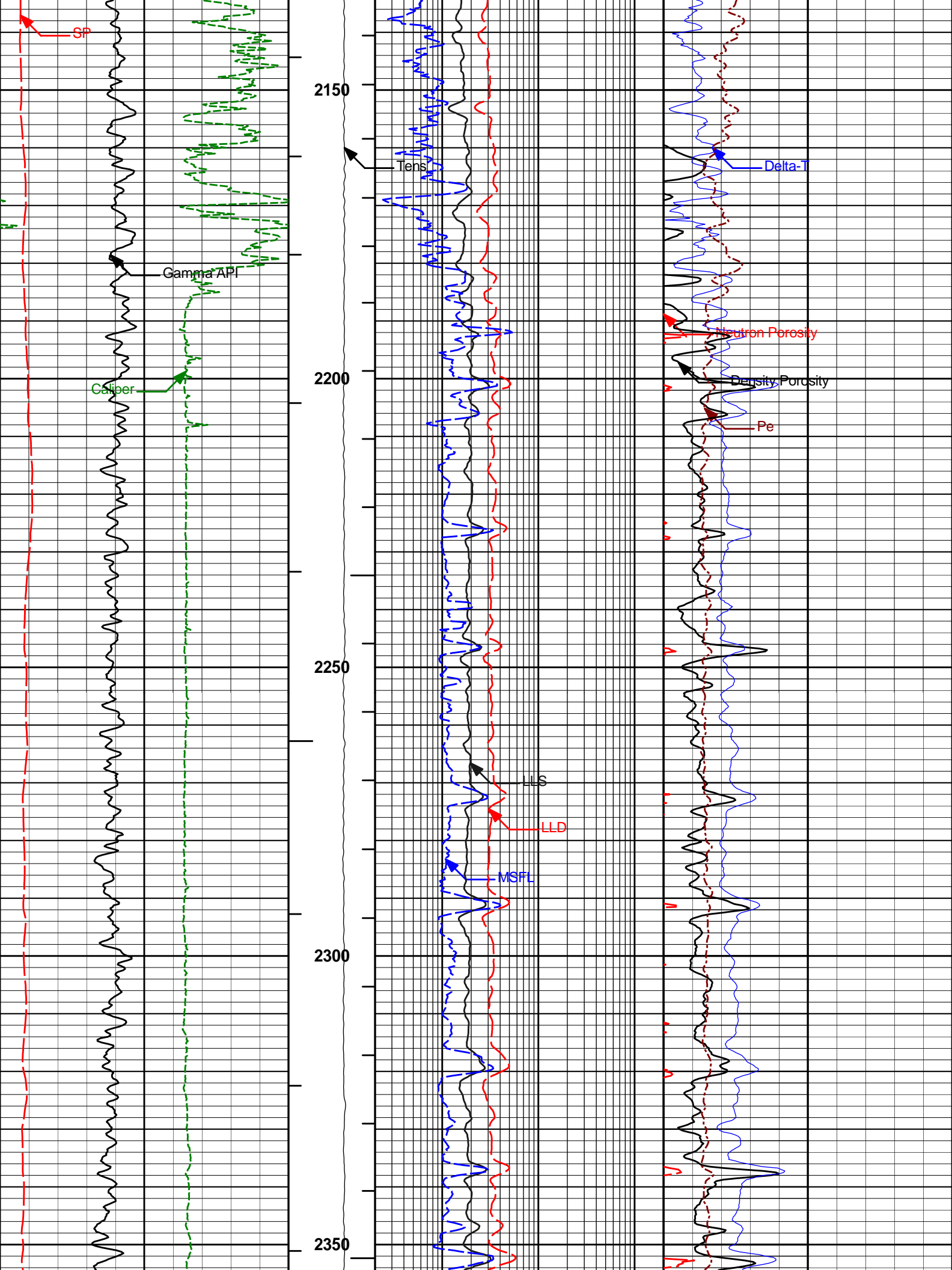


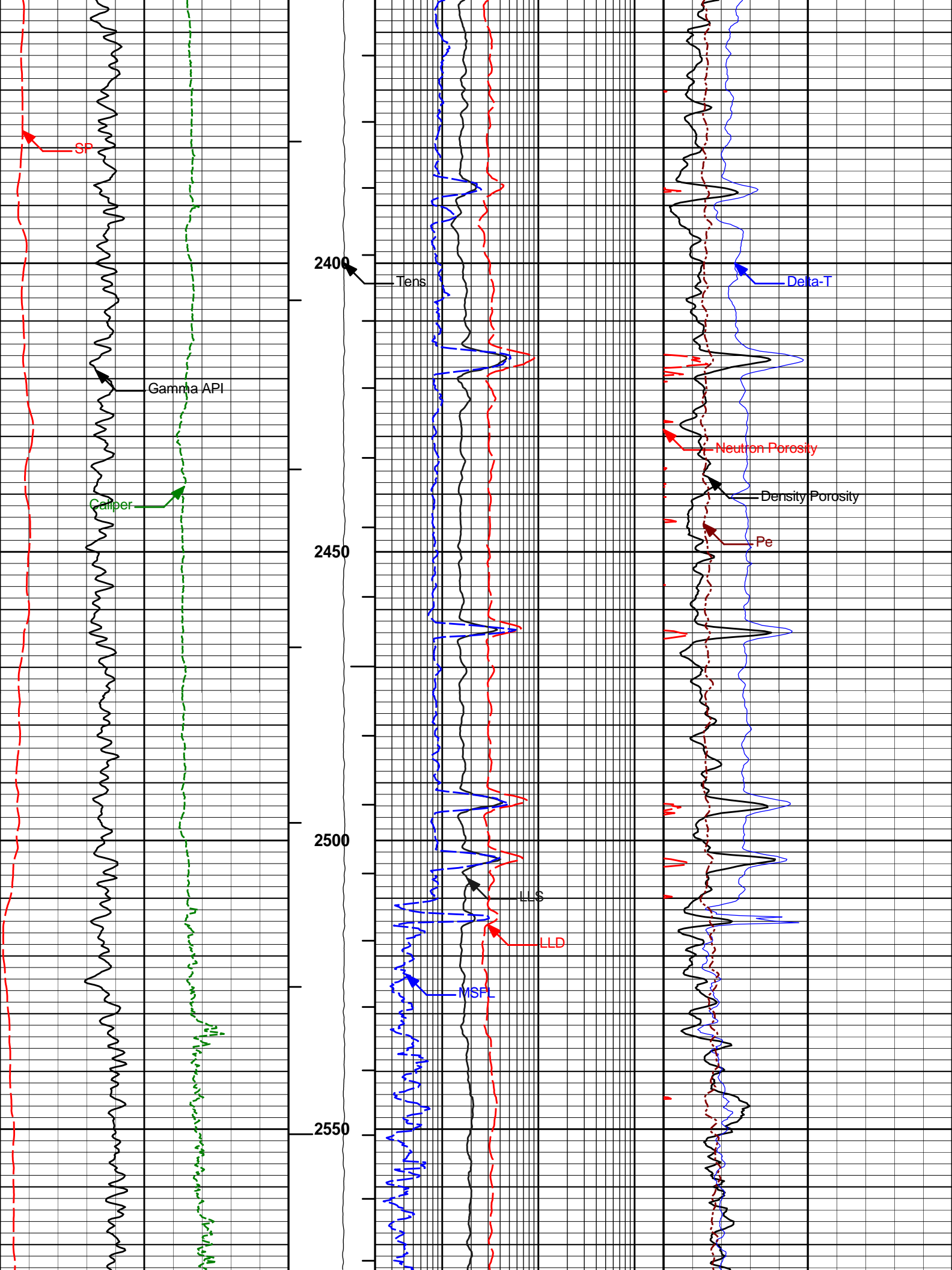


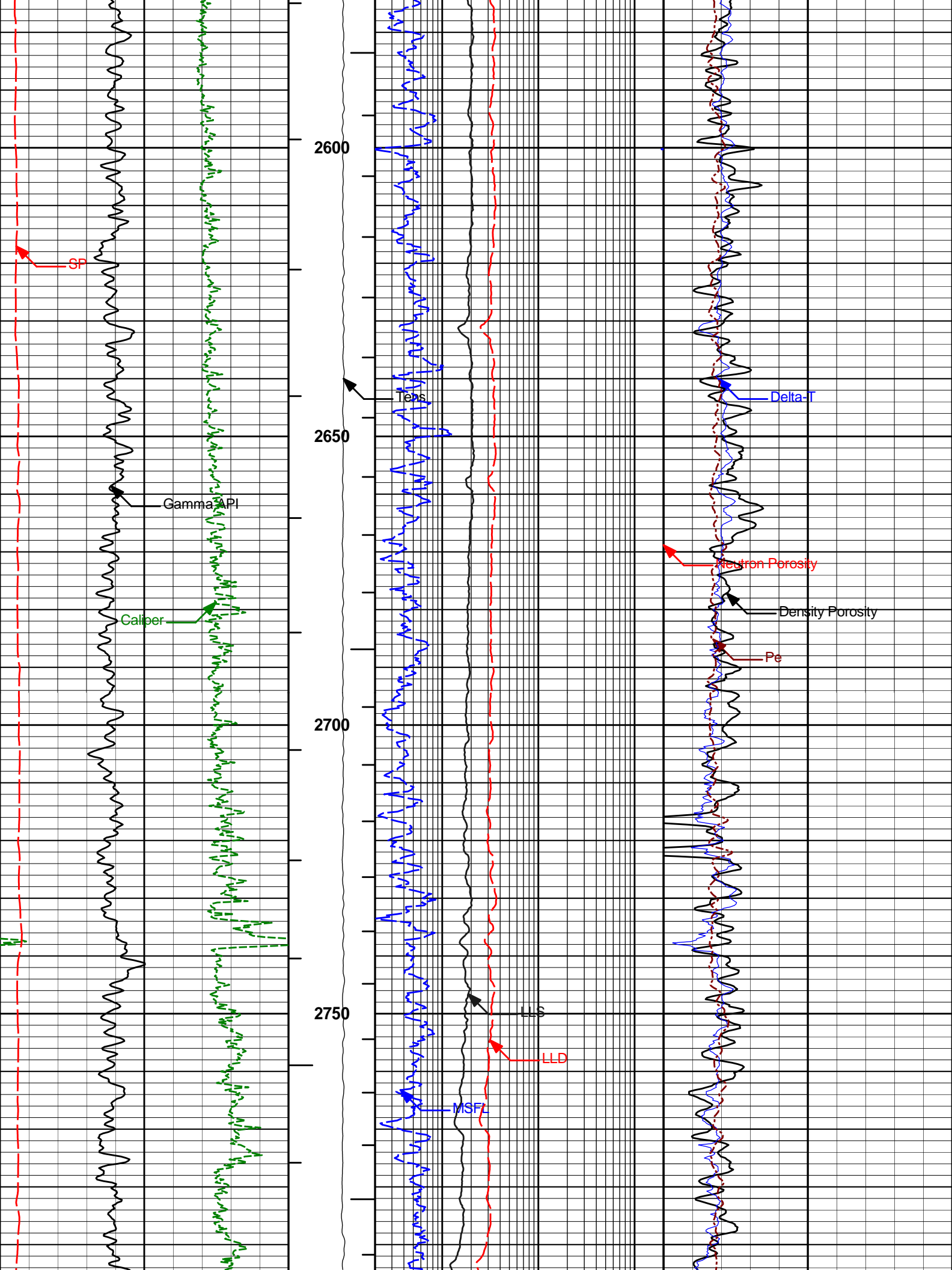


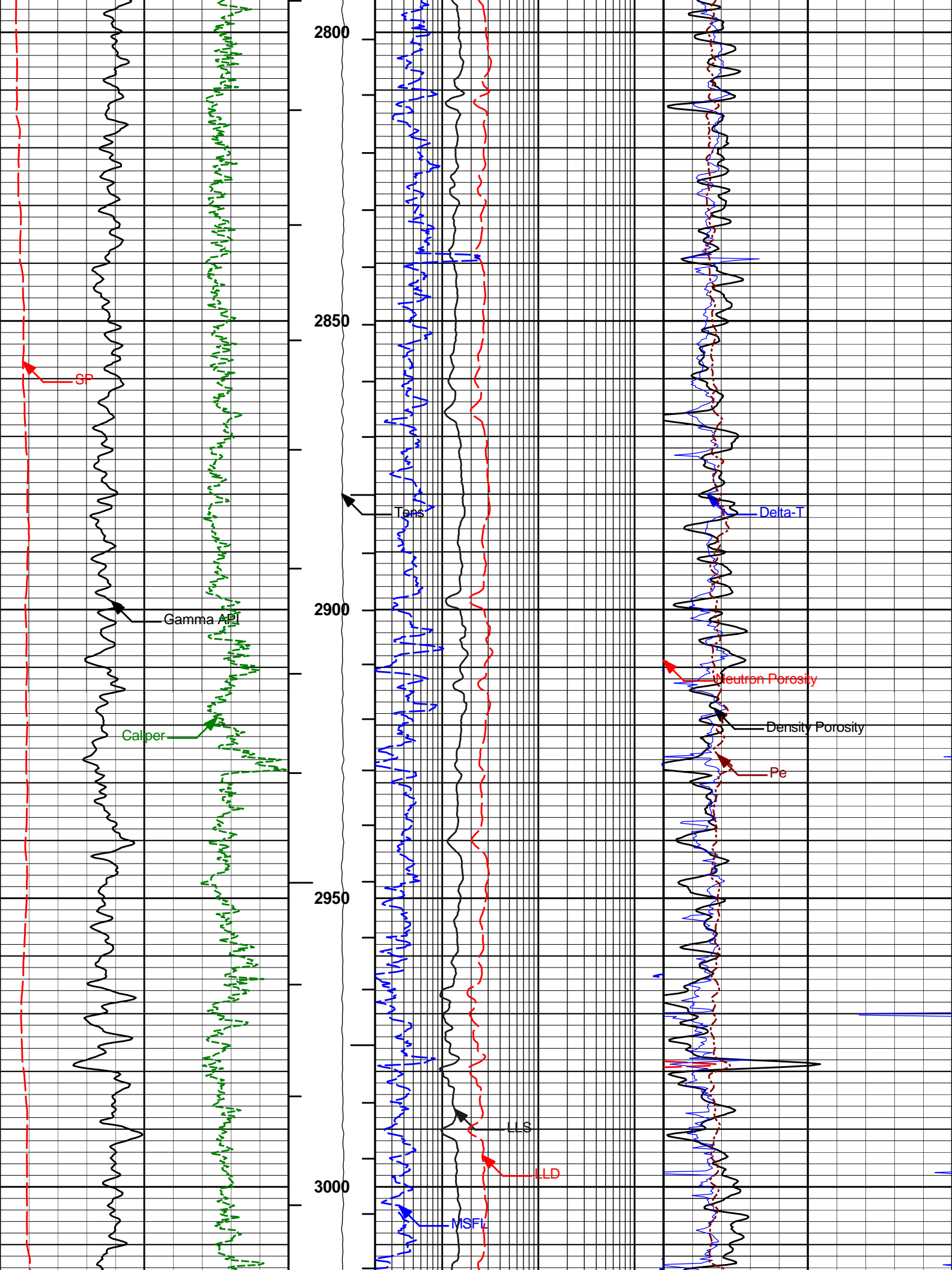


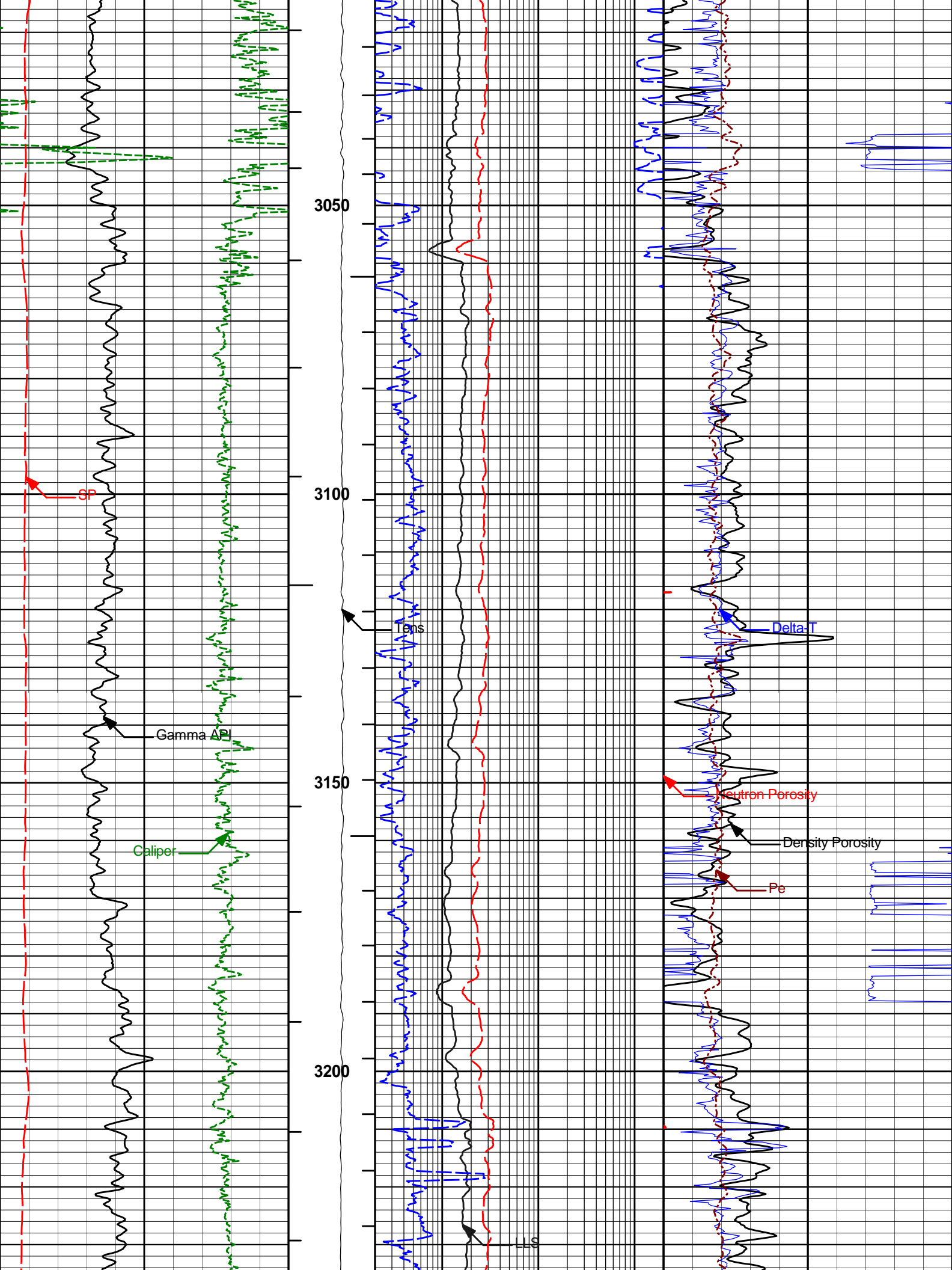


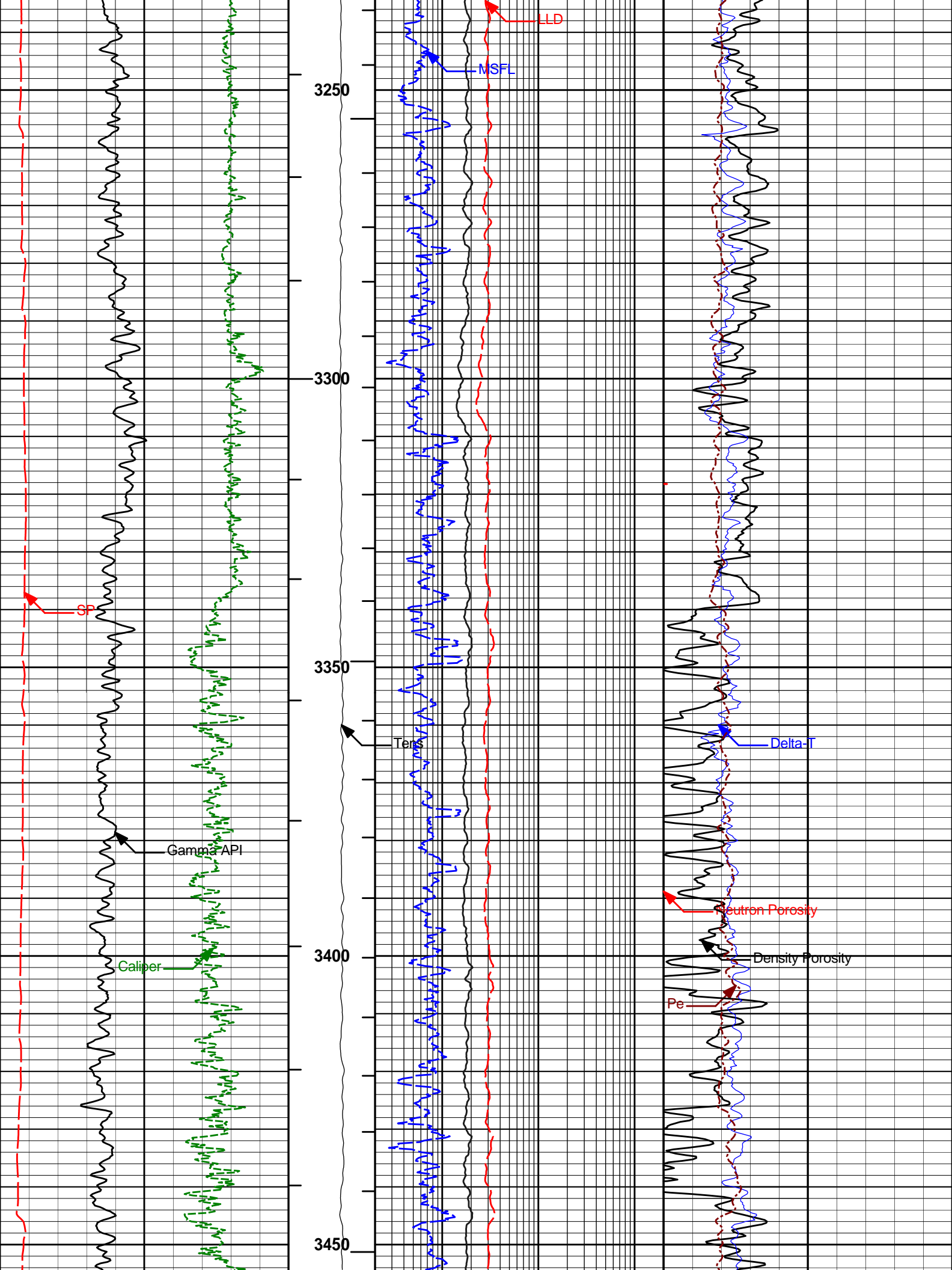


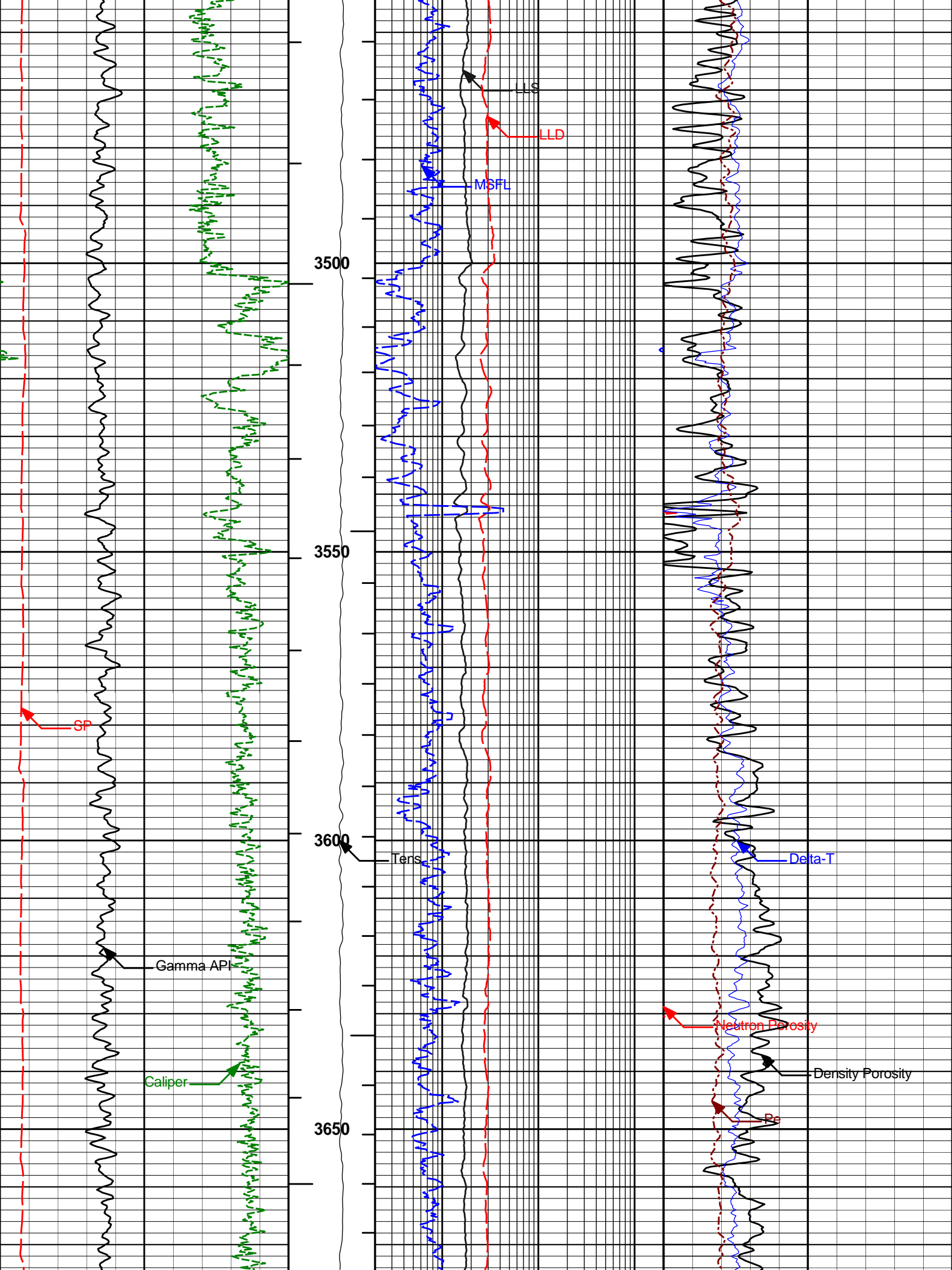


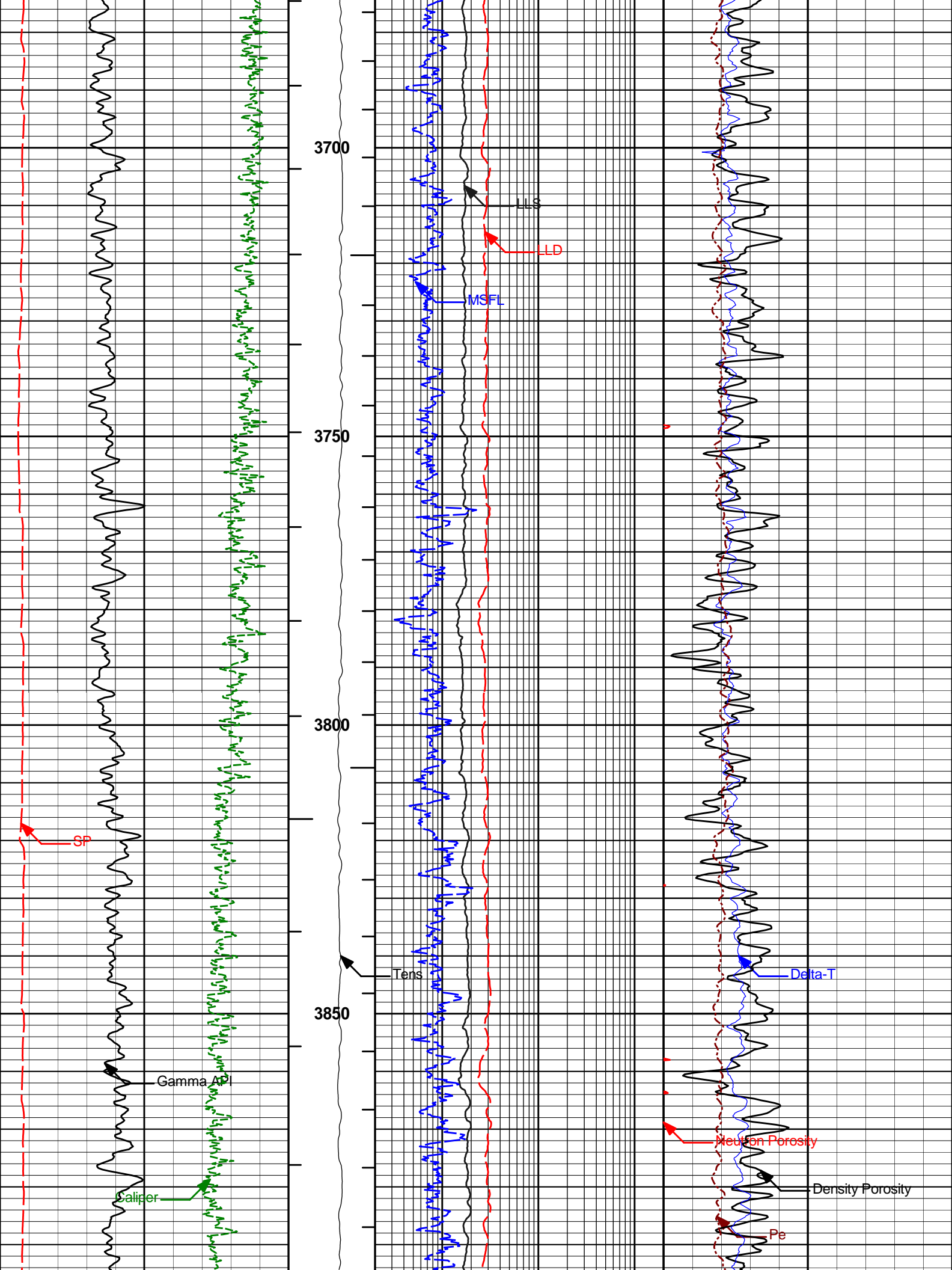


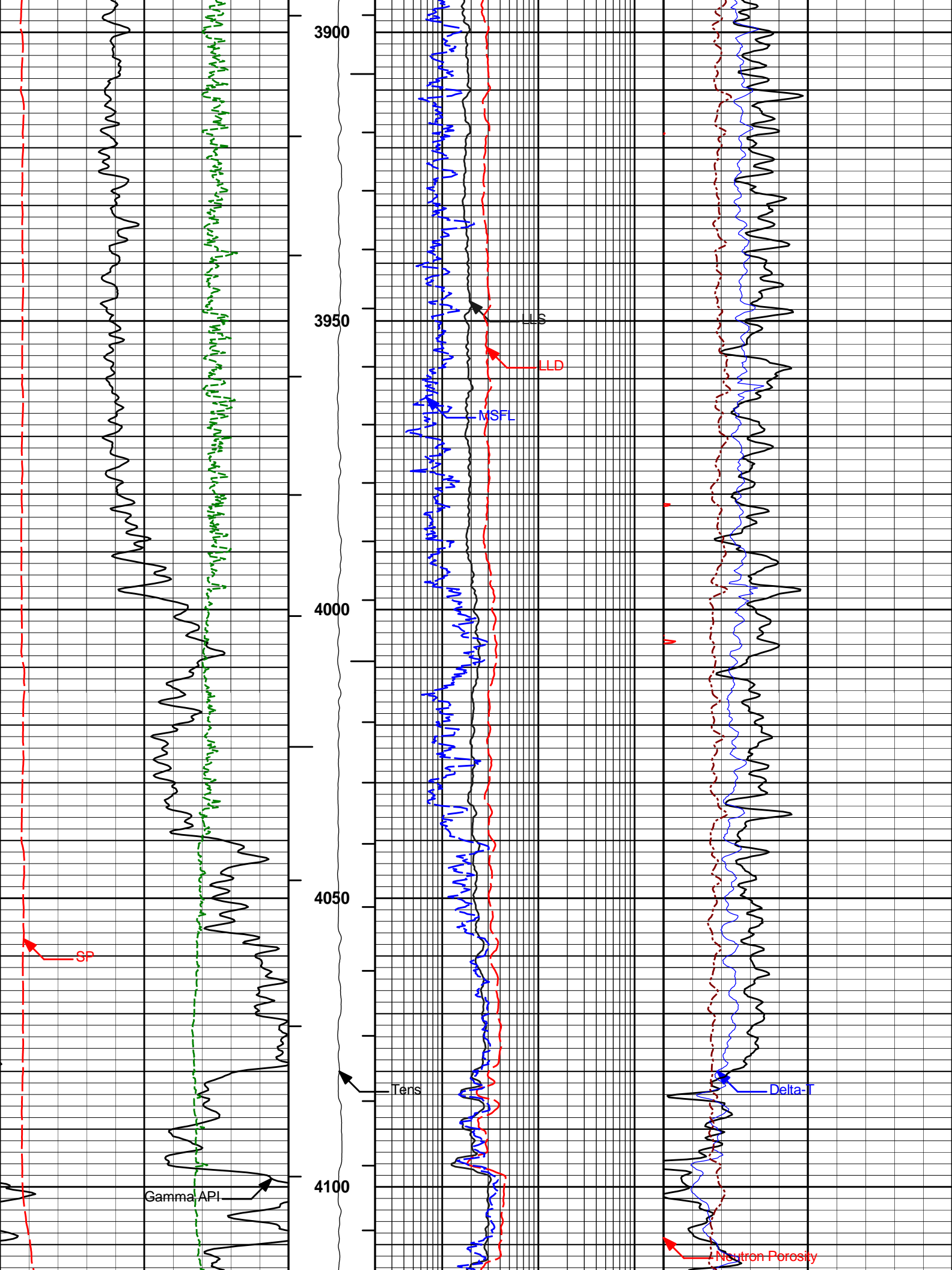


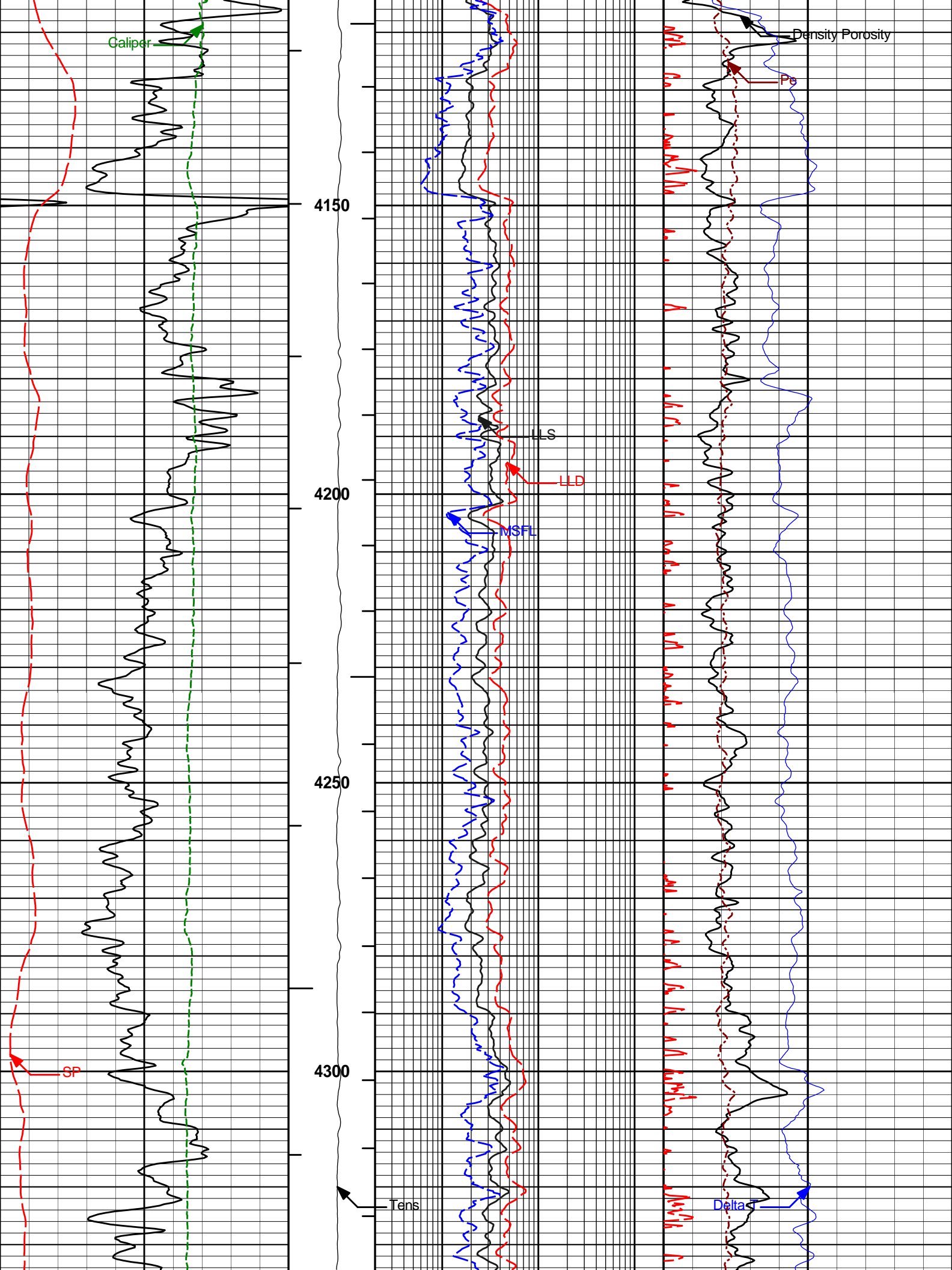


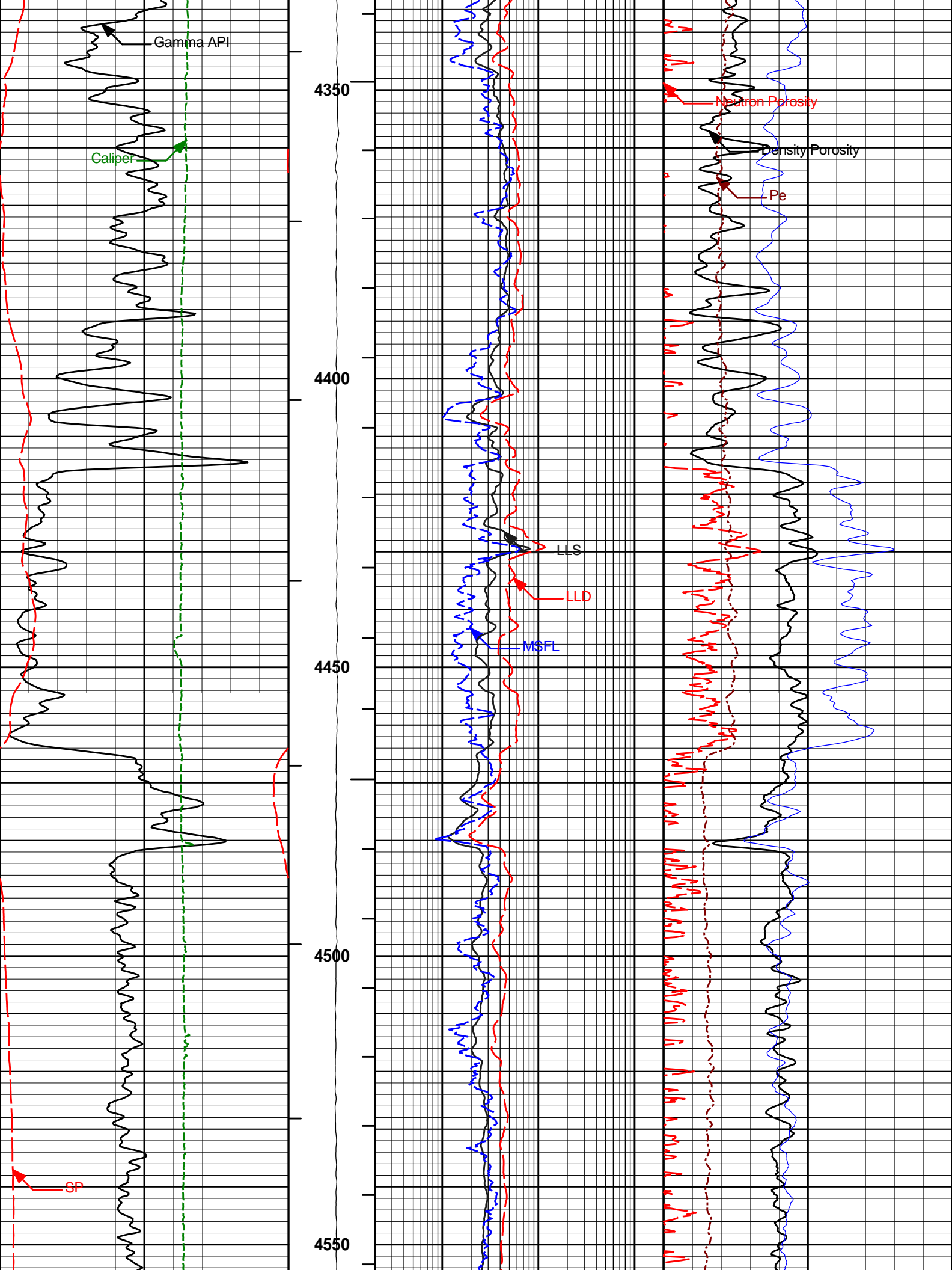


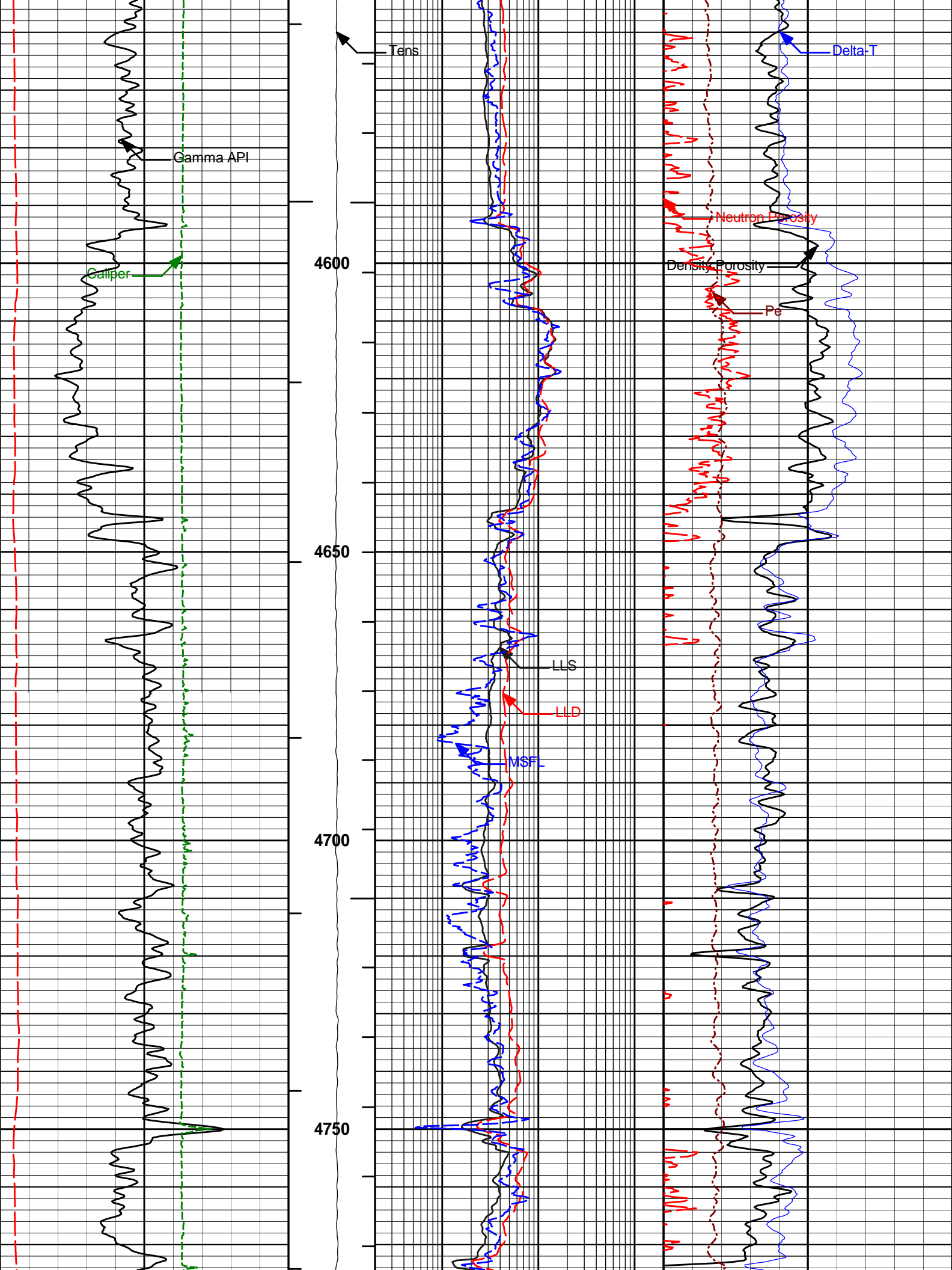


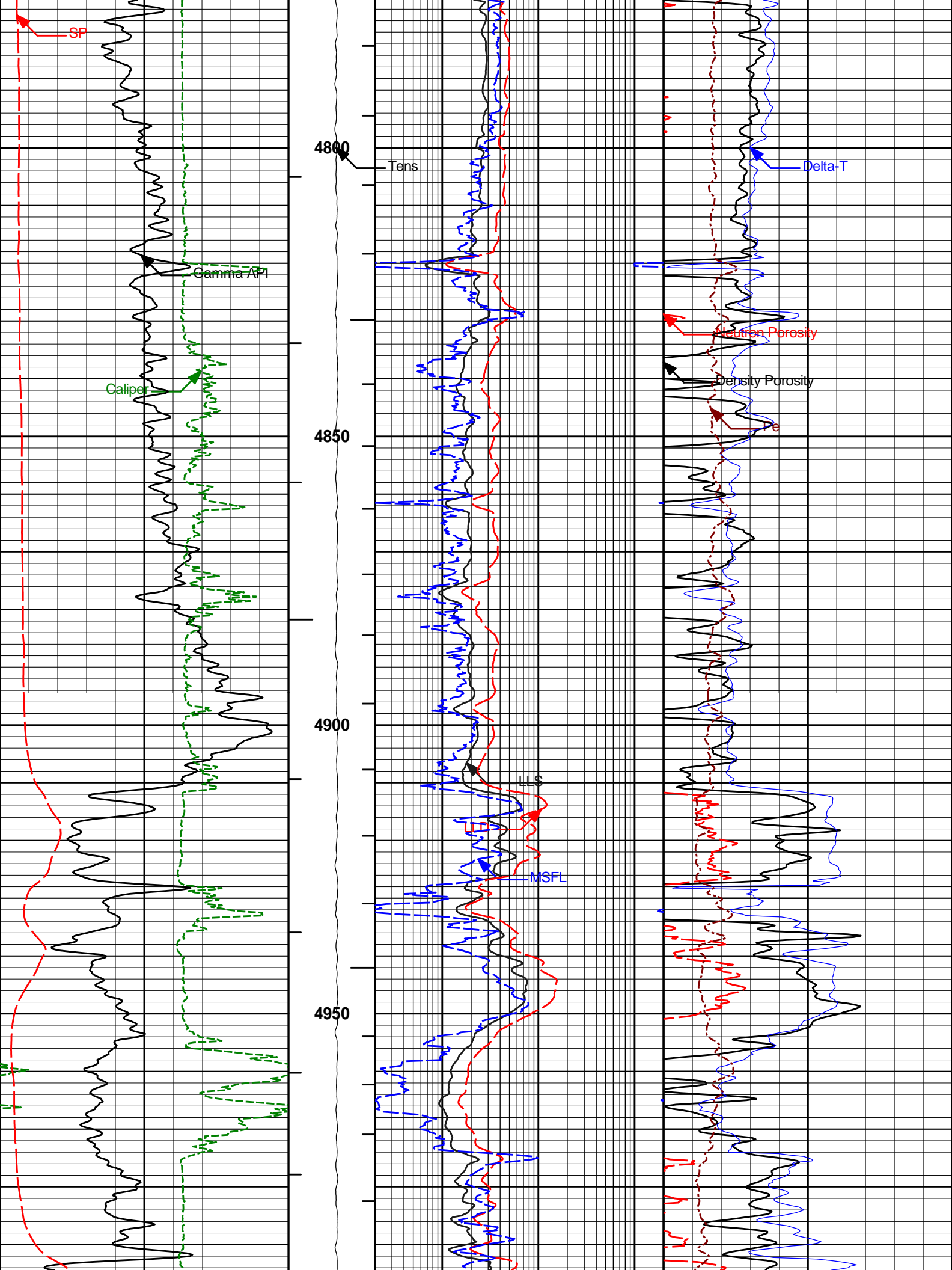


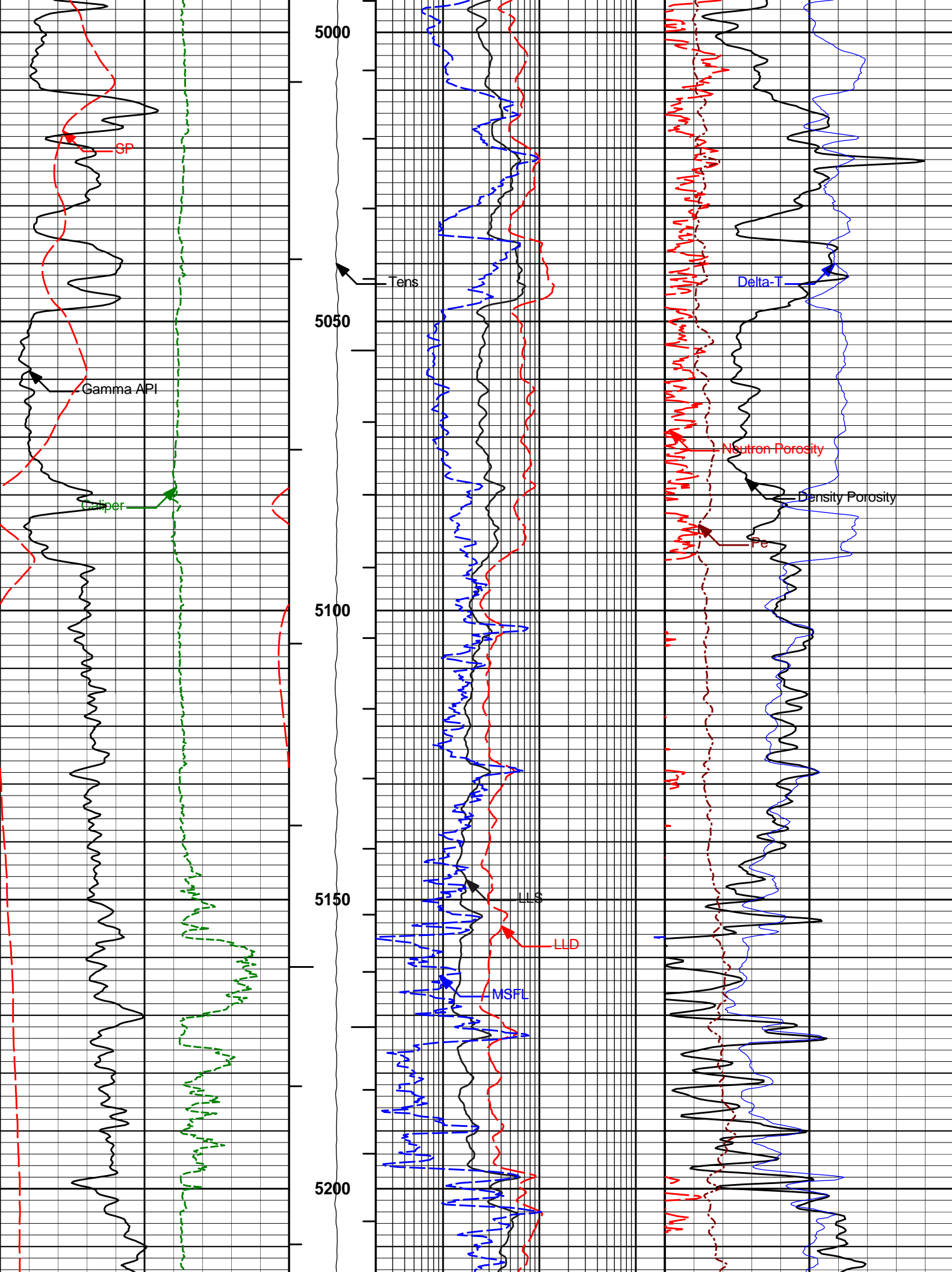


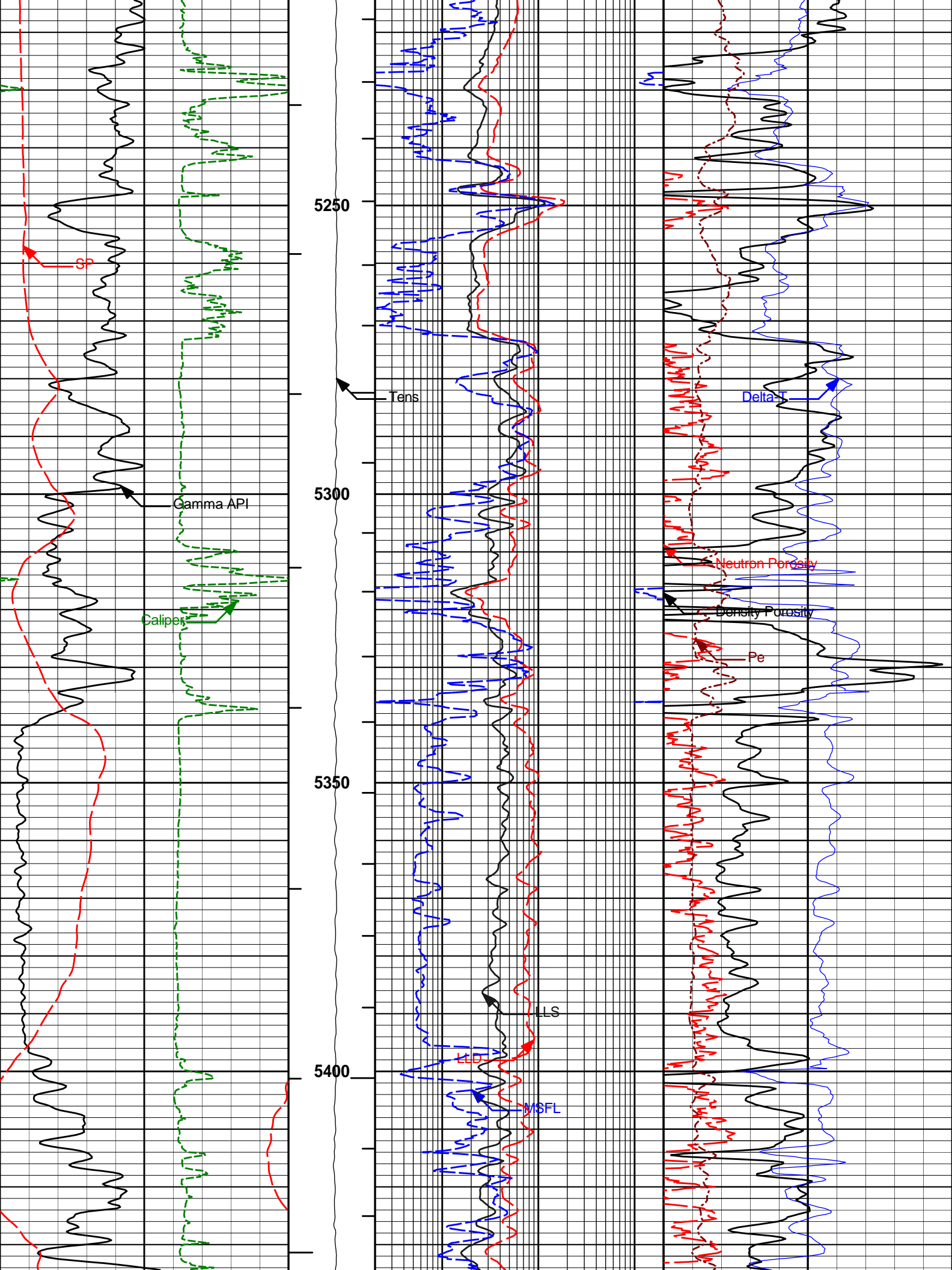


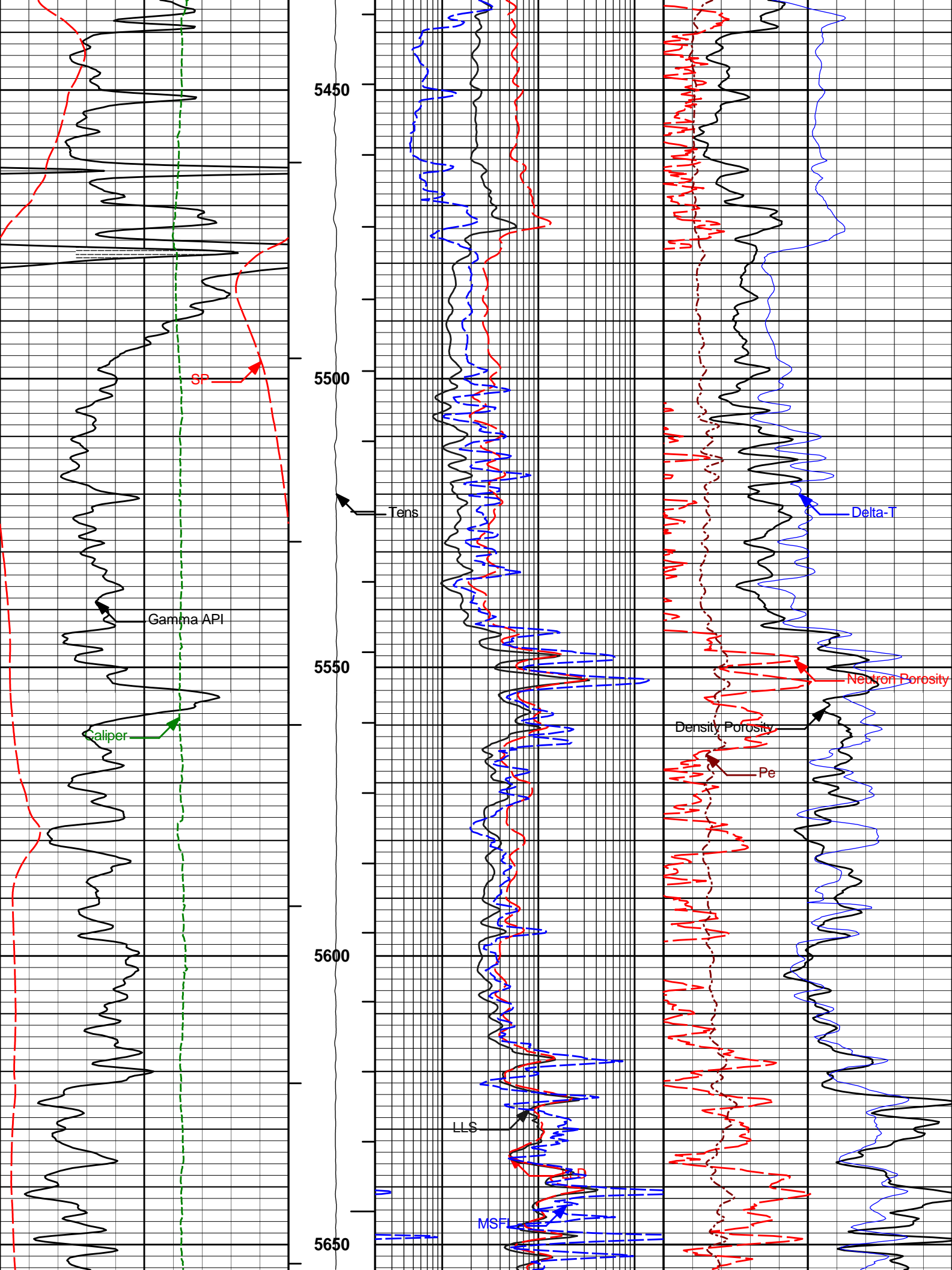


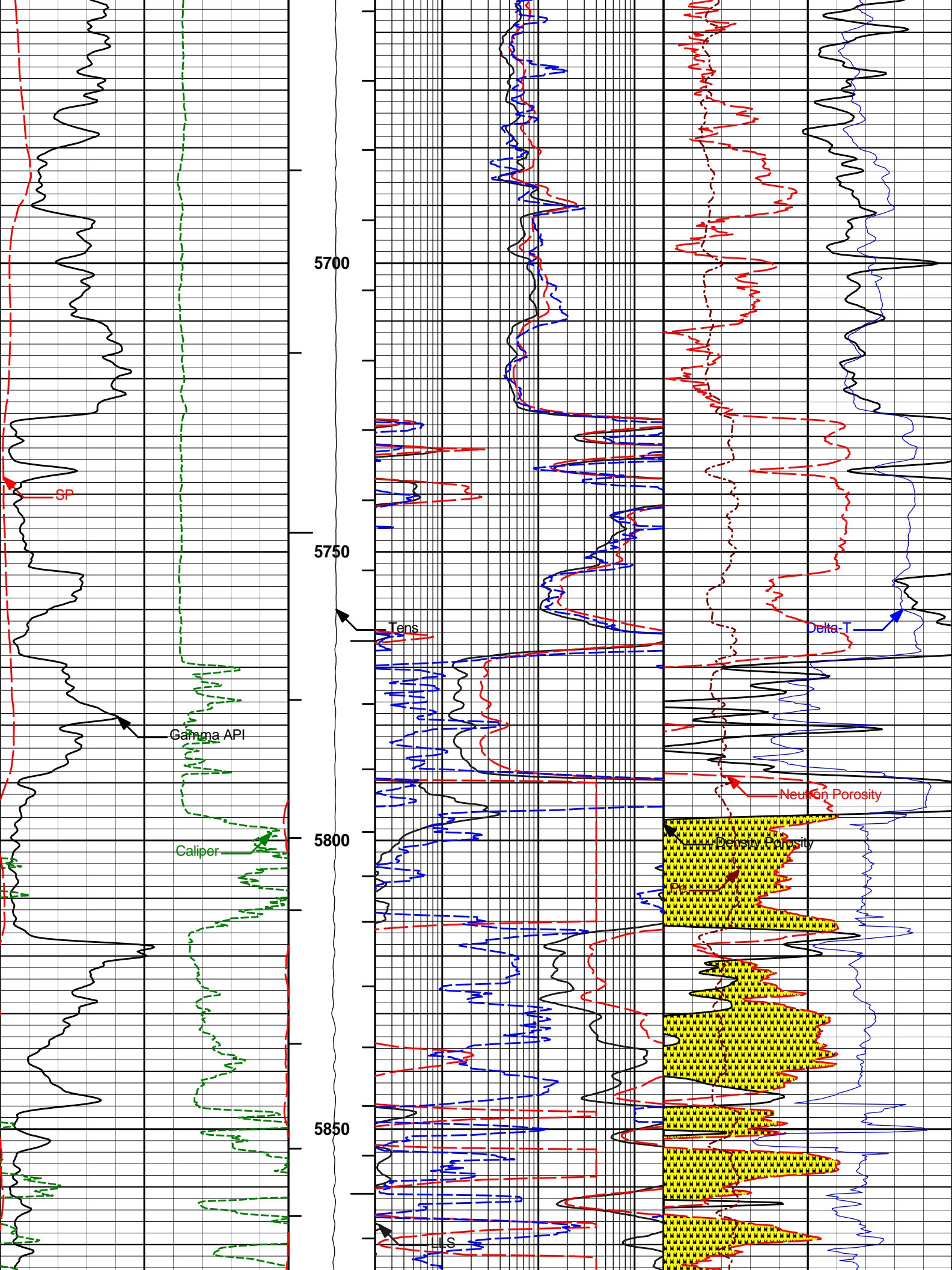


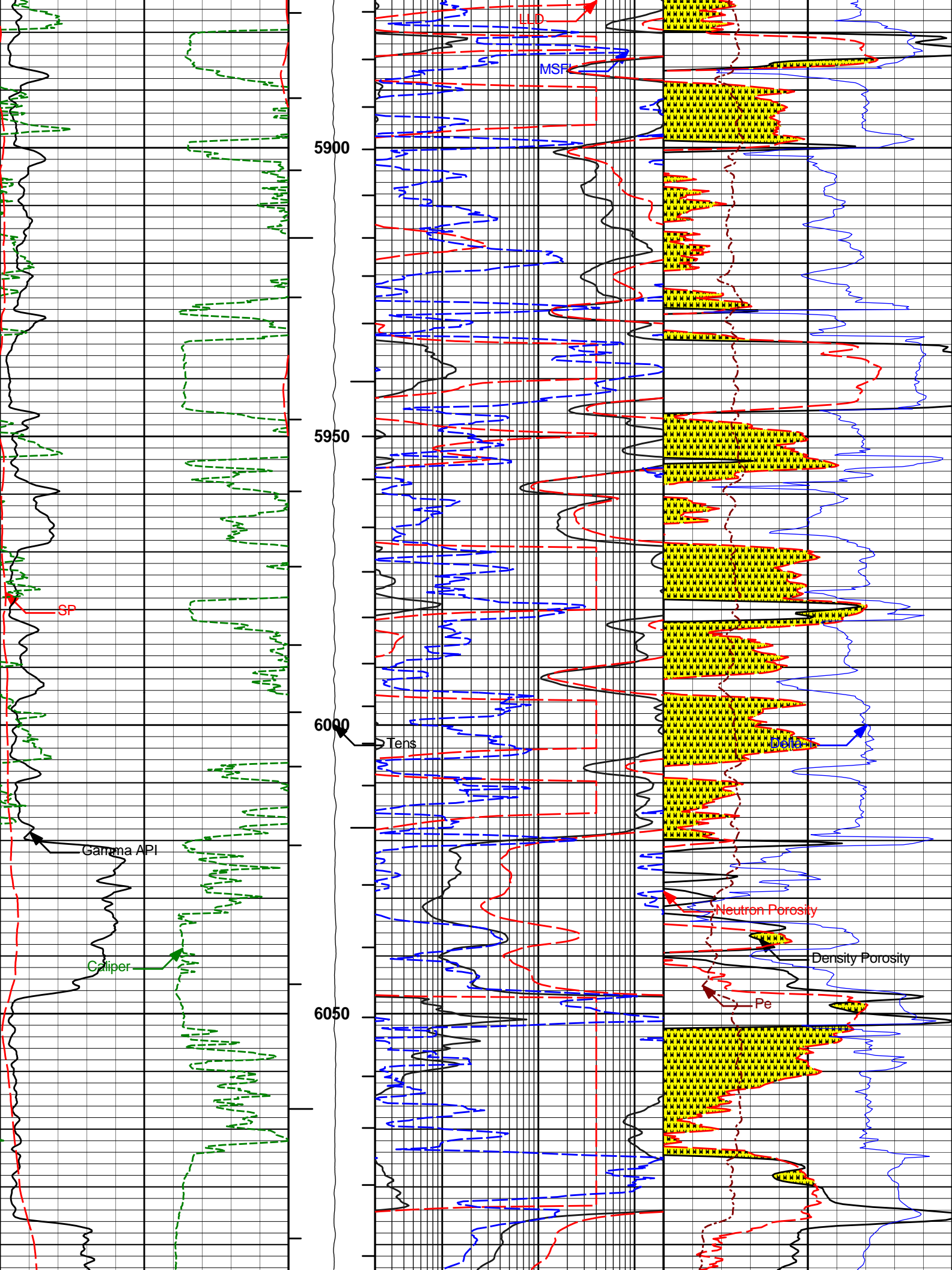


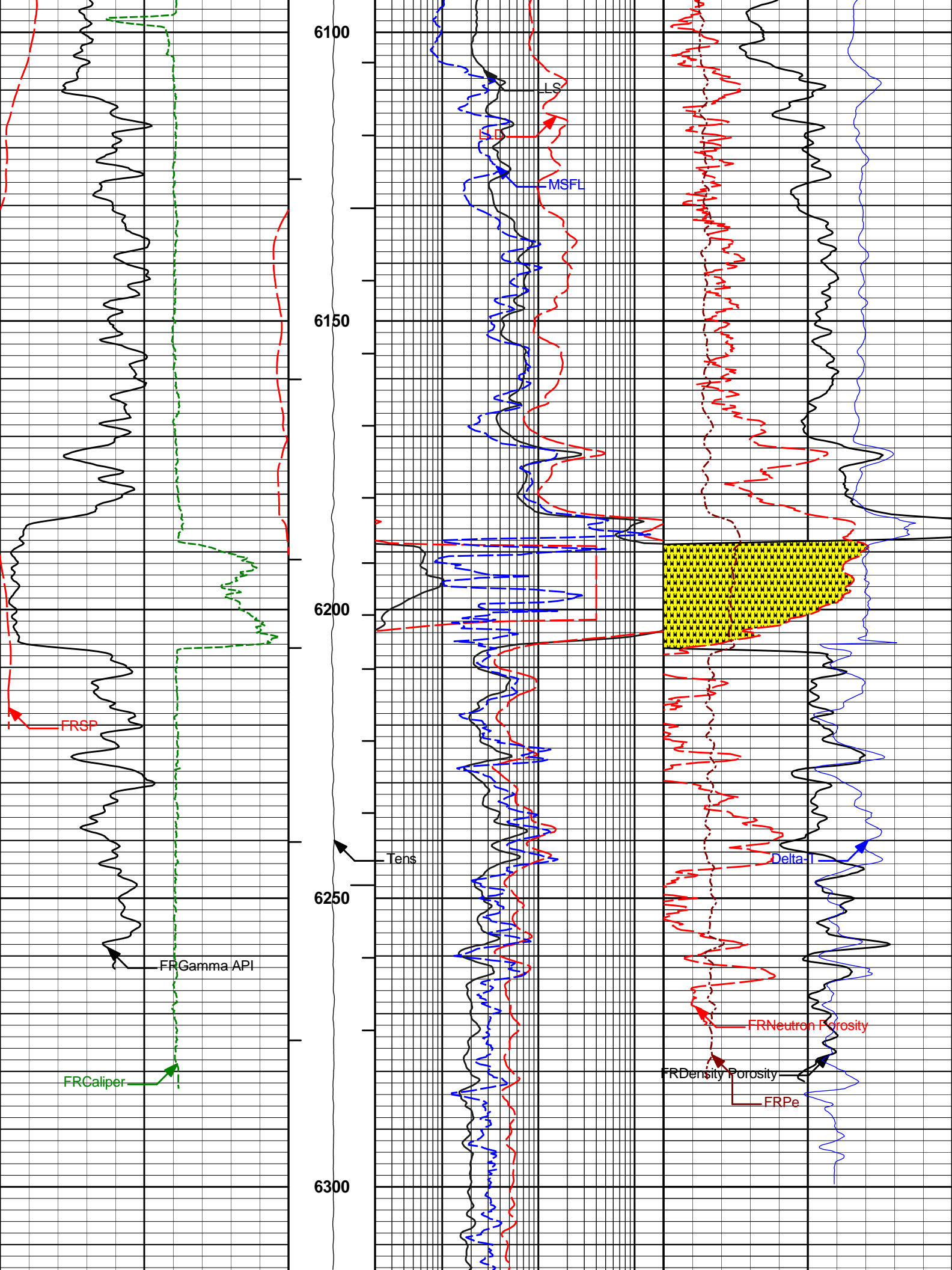


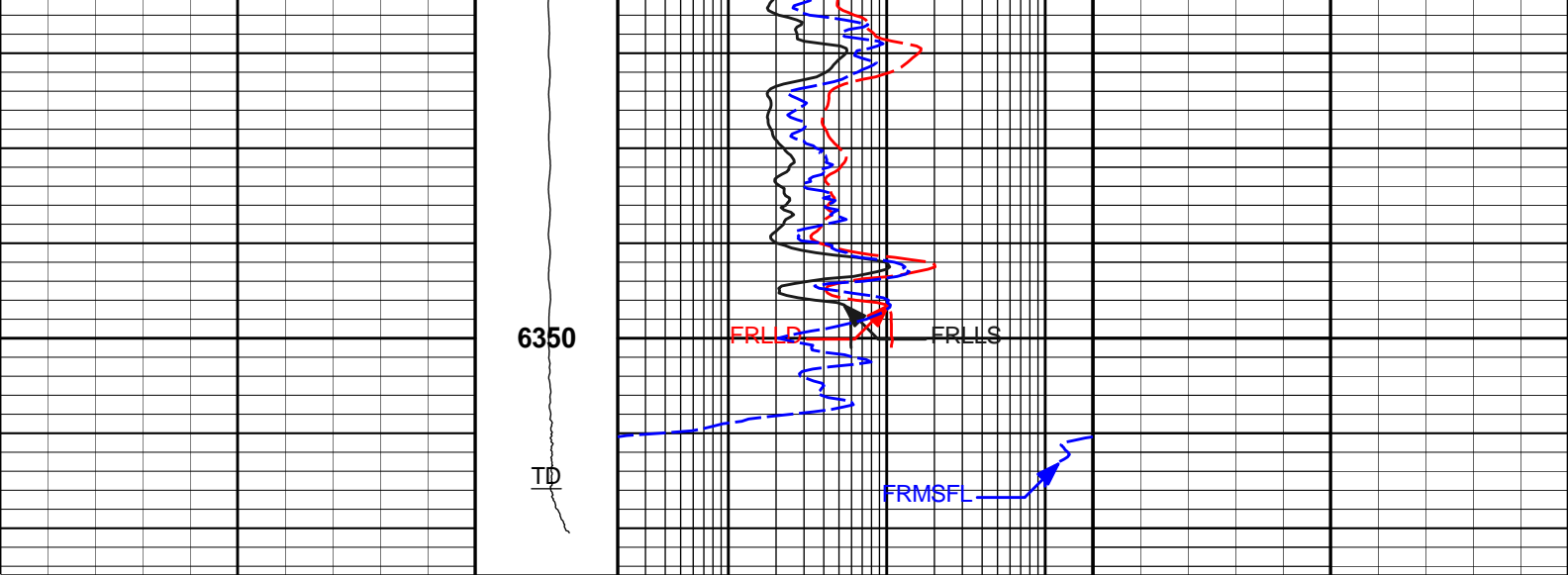












0	SP	200	1 : 240	0.2	LLD	200	0	Pe	10
	millivolts				ohmm				
0	Gamma API	200	BHVT	0.2	LLS	200	30	Density Porosity	-10
	api				ohmm			percent	
6	Caliper	16	AHVT	0.2	MSFL	200	30	Neutron Porosity	-10
	inches				ohmm			percent	
		10K Tens 0					140	Delta-T	40
		pounds						microsec per ft	

HALLIBURTON

Plot Time: 08-Jan-13 08:57:41
Plot Range: 510 ft to 6375 ft
Data: SORS_1P\Well Based\DAQ-0002-002\
Plot File: \COMP\MAIN

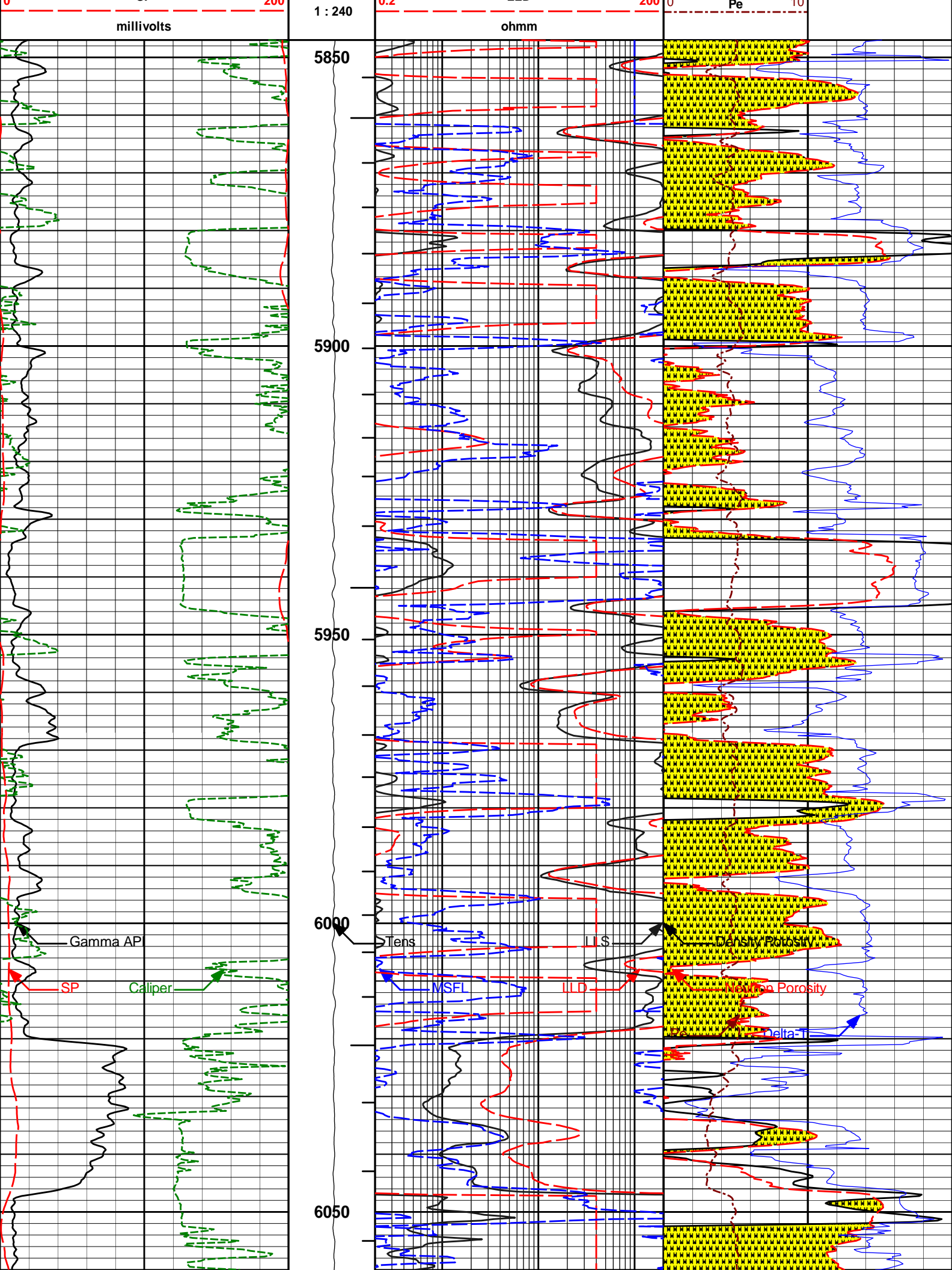
MAIN PASS 5" = 100'

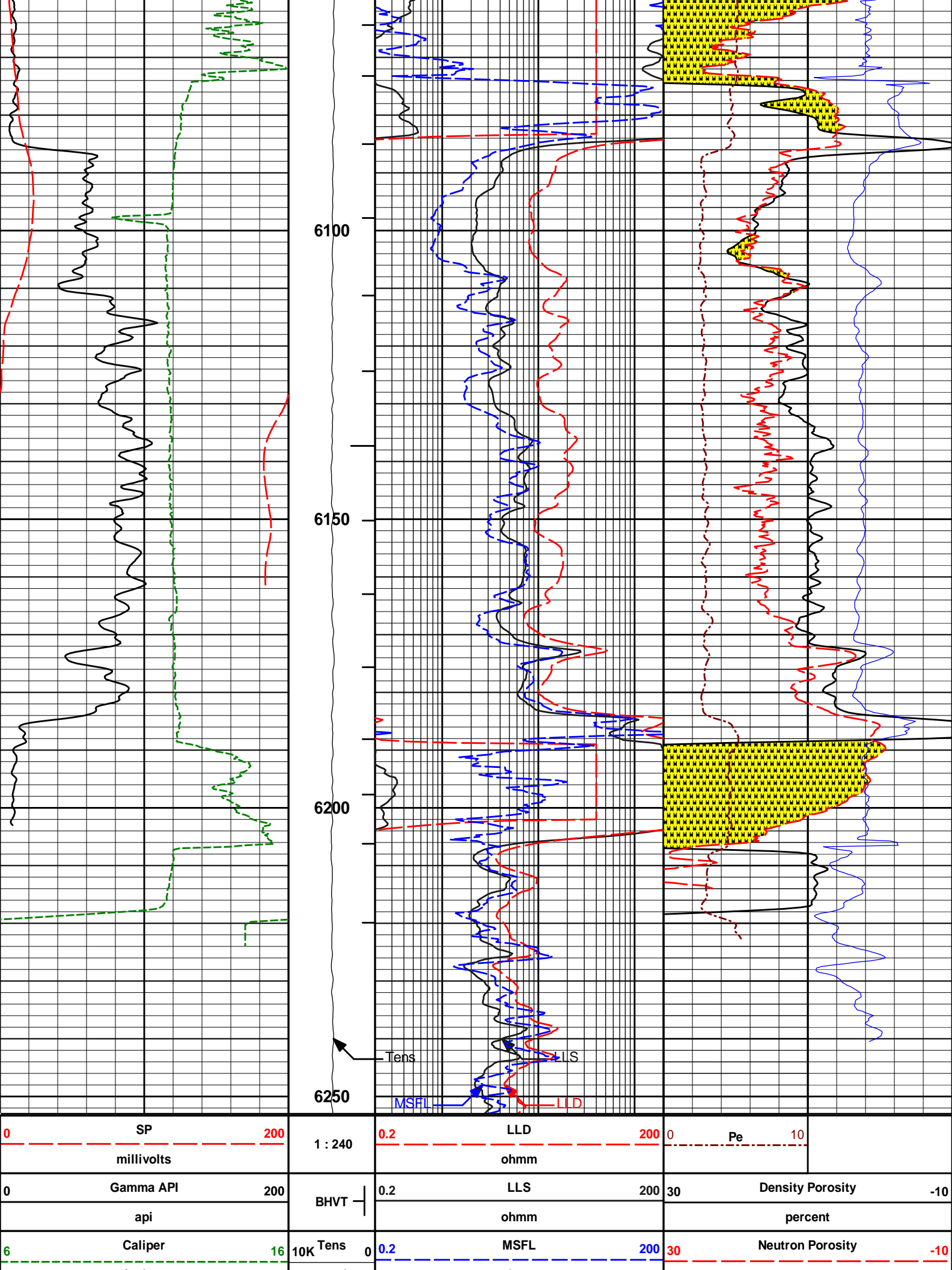
HALLIBURTON

Plot Time: 08-Jan-13 08:57:42
Plot Range: 5847 ft to 6253 ft
Data: SORS_1P\Well Based\DAQ-0002-001\
Plot File: \COMP\REP

MAIN PASS 5" = 100'

						140		Delta-T		40			
						microsec per ft							
6	Caliper		16	10K Tens	0	0.2	MSFL		200	30	Neutron Porosity		-10
inches				pounds		ohmm				percent			
0	Gamma API		200	BHVT		0.2	LLS		200	30	Density Porosity		-10
api						ohmm				percent			
0	SP		200			0.2	LLD		200	0	Pe		10





inches	pounds	ohmm	percent																								
			<div>140</div> <div>Delta-T</div> <div>40</div> <div>microsec per ft</div>																								
<div>HALLIBURTON</div> <div> Plot Time: 08-Jan-13 08:57:43 Plot Range: 5847 ft to 6253 ft Data: SORS_1P\Well Based\DAQ-0002-001\ Plot File: \COMP\REP </div>																											
MAIN PASS 5" = 100'																											
<div>HALLIBURTON</div> <div>CALIBRATION REPORT</div>																											
<div>NATURAL GAMMA RAY TOOL SHOP CALIBRATION</div> <div> <div> <div>Tool Name:</div> <div>GTET - 11958944</div> </div> <div> <div>Engineer:</div> <div>J. WALDEN</div> </div> <div> <div>Software Version:</div> <div>WL INSITE R3.8.0 (Build 2)</div> </div> </div> <div> <div>Reference Calibration Date:</div> <div>17-Dec-12 13:37:02</div> </div> <div> <div>Calibration Date:</div> <div>07-Jan-13 10:10:17</div> </div> <div> <div>Calibration Version:</div> <div>1</div> </div>																											
Calibrator Source S/N: TB-290 Calibrator API Reference:230.00 api Equivalent Calibrator API Reference:234.0 api																											
<table> <tr> <th>Measurement</th><th>Measured</th><th>Calibrated</th><th>Units</th></tr> <tr> <td>Background</td><td>77.4</td><td>76.1</td><td>api</td></tr> <tr> <td>Background + Calibrator</td><td>315.1</td><td>310.2</td><td>api</td></tr> <tr> <td>Calibrator</td><td>237.8</td><td>234.0</td><td>api</td></tr> </table>				Measurement	Measured	Calibrated	Units	Background	77.4	76.1	api	Background + Calibrator	315.1	310.2	api	Calibrator	237.8	234.0	api								
Measurement	Measured	Calibrated	Units																								
Background	77.4	76.1	api																								
Background + Calibrator	315.1	310.2	api																								
Calibrator	237.8	234.0	api																								
<div>NATURAL GAMMA RAY TOOL FIELD CALIBRATION</div> <div> <div> <div>Tool Name:</div> <div>GTET - 11958944</div> </div> <div> <div>Engineer:</div> <div>J. WALDEN</div> </div> <div> <div>Software Version:</div> <div>WL INSITE R3.8.0 (Build 2)</div> </div> </div> <div> <div>Reference Calibration Date:</div> <div>07-Jan-13 10:10:17</div> </div> <div> <div>Calibration Date:</div> <div>07-Jan-13 10:13:16</div> </div> <div> <div>Calibration Version:</div> <div>1</div> </div>																											
Calibrator Source S/N: TB-290 Calibrator API Reference:230.00 api Equivalent Calibrator API Reference:234.0 api																											
<table> <tr> <th>Field Verification</th><th>Shop</th><th>Field</th><th>Units</th></tr> <tr> <td>Background</td><td>76.1</td><td>76.8</td><td>api</td></tr> <tr> <td>Background + Calibrator</td><td>310.2</td><td>311.2</td><td>api</td></tr> <tr> <td>Calibrator</td><td>234.0</td><td>234.4</td><td>api</td></tr> </table> <table> <tr> <th>Shop</th><th>Field</th><th>Difference</th><th>Tolerance</th></tr> <tr> <td>234.0</td><td>234.4</td><td>-0.4</td><td>+/- 9.00</td></tr> </table>				Field Verification	Shop	Field	Units	Background	76.1	76.8	api	Background + Calibrator	310.2	311.2	api	Calibrator	234.0	234.4	api	Shop	Field	Difference	Tolerance	234.0	234.4	-0.4	+/- 9.00
Field Verification	Shop	Field	Units																								
Background	76.1	76.8	api																								
Background + Calibrator	310.2	311.2	api																								
Calibrator	234.0	234.4	api																								
Shop	Field	Difference	Tolerance																								
234.0	234.4	-0.4	+/- 9.00																								
<div>DUAL SPACED NEUTRON SHOP CALIBRATION</div> <div> <div> <div>Tool Name:</div> <div>DSNT - 11219332</div> </div> <div> <div>Engineer:</div> <div>J. SCHMIDT</div> </div> <div> <div>Software Version:</div> <div>WL INSITE R3.8.0 (Build 2)</div> </div> </div> <div> <div>Reference Calibration Date:</div> <div>13-Nov-12 12:16:23</div> </div> <div> <div>Calibration Date:</div> <div>17-Dec-12 13:59:21</div> </div> <div> <div>Calibration Version:</div> <div>1</div> </div>																											
Logging Source S/N: DSN430 Tank Serial Number: 11068236 Reference value assigned to Tank: 53.720																											

Snow Block S/N: 37526

Calibration Tank Water Temperature: 50 degF

Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.977	0.978	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):	0.2220	0.2223	0.0004	+/- 0.0020
Calibrated Ratio:	10.10	10.11	0.012	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0766	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 - 11219332

Reference Calibration Date: 17-Dec-12 13:59:21

Engineer: J. WALDEN

Calibration Date: 07-Jan-13 10:21:18

Software Version: WL INSITE R3.8.0 (Build 2)

Calibration Version: 1

Logging Source S/N: DSN430

Snow Block S/N: 37526

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0766	0.0745	-0.0021	+/- 0.0150

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

DENSITY CALIPER SHOP CALIBRATION

Tool Name: SDLT - 11014271

Reference Calibration Date: 17-Dec-12 17:09:10

Engineer: J. SCHMIDT

Calibration Date: 17-Dec-12 17:13:23

Software Version: WL INSITE R3.8.0 (Build 2)

Calibration Version: 1

Host Tool Name: DSNT - 11219332

CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-3261.53	-3152.75	-7000.00 - -1000.00
Pad Gain	0.0003781	0.0003749	0.000200 - 0.000600
Arm Offset	-3871.74	-3981.46	-5000.00 - 3000.00
Arm Gain	0.0005207	0.0005253	0.000300 - 0.000700
Arm Power	-0.000001960	-0.000002330	-0.000010000 - 0.000010000

Amplitude: -0.00001980 -0.00002330 -0.00001000 -0.00001000

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)	3.74	3.75	0.01	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.50	6.50	0.00	+/- 0.20
Medium Ring (in)	8.24	8.25	0.01	+/- 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

SPECTRAL DENSITY SHOP CALIBRATION			
Tool Name:	SDLT Pad - 11816600	Reference Calibration Date:	17-Dec-12 16:00:17
Engineer:	J. SCHMIDT	Calibration Date:	17-Dec-12 16:37:26
Software Version:	WL INSITE R3.8.0 (Build 2)	Calibration Version:	1

Logging Source S/N: 5256 GW

Aluminum Block S/N: 63066

Density: 2.602g/cc

Pe: 3.100

Magnesium Block S/N: N/A

Density: 1.691g/cc

Pe: 2.650

DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0810	1.0859	0.90 - 1.10
Near Dens Gain	1.0417	1.0457	0.90 - 1.10
Near Peak Gain	1.0198	1.0307	0.90 - 1.10
Near Lith Gain	0.9866	0.9715	0.90 - 1.10
Far Bar Gain	1.0120	1.0115	0.90 - 1.10
Far Dens Gain	1.0005	1.0015	0.90 - 1.10
Far Peak Gain	0.9937	0.9951	0.90 - 1.10
Far Lith Gain	0.9743	0.9759	0.90 - 1.10
Near Bar Offset	-0.6695	-0.7187	NONE
Near Dens Offset	-0.2738	-0.3127	NONE
Near Peak Offset	-0.0563	-0.1539	NONE
Near Lith Offset	0.2090	0.3300	NONE
Far Bar Offset	-0.0766	-0.0725	NONE
Far Dens Offset	0.0329	0.0222	NONE
Far Peak Offset	0.0820	0.0687	NONE
Far Lith Offset	0.2248	0.2109	NONE
Near Bar Background	1033.91	1032.22	700 - 1450
Near Dens Background	343.03	343.79	230 - 480
Near Peak Background	150.10	150.01	100 - 210
Near Lith Background	183.01	183.49	125 - 260
Far Bar Background	658.62	661.91	450 - 900
Far Dens Background	257.43	257.27	175 - 345
Far Peak Background	121.42	122.44	75 - 115
Far Lith Background	121.42	122.44	75 - 115

Far Peak Background	101.42	102.41	70 - 140
Far Lith Background	105.96	106.13	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.694	1.691	-0.003	+/- 0.015
Pe	2.567	2.601	0.034	+/- 0.150
ALUMINUM				
Density (g/cc)	2.604	2.602	-0.002	+/- 0.01500
Pe	3.060	3.061	0.001	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0004	+/- 0.0110	0.0005	+/- 0.0140
Magnesium Block	0.0009	+/- 0.0110	-0.0006	+/- 0.0140
Aluminum Block	0.0002	+/- 0.0110	-0.0000	+/- 0.0140
Resolution	8.60	6.00 - 11.50	8.70	6.00 - 11.50
Internal Verifier(B+D+P+L)	1710	1200 - 2700	1128	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 Pad - 11816600	Reference Calibration Date:	17-Dec-12 16:37:26
Engineer:	J. WALDEN	Calibration Date:	07-Jan-13 09:57:15
Software Version:	WL INSITE R3.8.0 (Build 2)	Calibration Version:	1

Pad Temperature: 57.6 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1709.502	1709.182	-0.320	16.593
Far (B+D+P+L) cps	1127.718	1126.210	-1.508	17.664
Near Resolution	8.60	8.74	0.140	0.50
Far Resolution	8.70	8.95	0.250	1.00

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

SDLT CALIPER FIELD CALIBRATION

Tool Name:	SDLT - 11014271	Reference Calibration Date:	17-Dec-12 17:13:23
Engineer:	J. WALDEN	Calibration Date:	07-Jan-13 09:59:53
Software Version:	WL INSITE R3.8.0 (Build 2)	Calibration Version:	1

MEASURED CALIPER VALUES				
Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.82	0.07	+/- 0.10
Ring Diameter	8.25	8.17	-0.08	+/- 0.15

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

ACCELEROMETER AND MAGNETOMETER SHOP CALIBRATION			
Tool Name:	IDT - 11277451	Reference Calibration Date:	22-Dec-11 12:25:38
Engineer:	R. TWEETEN	Calibration Date:	12-Dec-12 09:29:09
Software Version:	WL INSITE R3.8.0 (Build 2)	Calibration Version:	1

Reference Gravity Field: 1.0000 g

Reference Magnetic Field: 52800.0000 nT

* QF : value of 0 is shown for bad quality if | data - reference | > (2 * standard deviation) and > (0.5% of reference value)

ACCELEROMETER CALIBRATION RAW DATA VALUE					
Raw Acc X	Raw Acc Y	Raw Acc Z	Quality(Gravity)	Quality Error(%)	QF
0.4269	-0.5884	-0.0061	1.0002	99.9829	1
-0.5599	-0.4780	-0.0063	1.0000	99.9967	1
-0.4375	0.6033	-0.0067	1.0000	99.9953	1
0.5831	0.4446	-0.0061	1.0000	99.9994	1
-0.0172	0.7436	-0.0064	0.9999	99.9936	1
0.6184	0.3018	0.1163	0.9998	99.9824	1
-0.0564	0.7421	-0.0065	1.0001	99.9927	1
0.7216	0.0940	-0.0061	1.0001	99.9879	1
-0.0078	-0.7309	-0.0061	0.9999	99.9889	1
-0.7395	-0.0298	-0.0065	1.0000	99.9995	1
-0.0143	0.0013	0.3591	1.0000	99.9969	1
0.6578	-0.1071	-0.1504	0.9999	99.9929	1

ACCELEROMETER QUALITY SUMMARY		
Average Calculated Gravity Field	1.0000	g
Standard Deviation Calculated Gravity Field	0.0001	g

ACCELEROMETER GAIN AND OFFSET		
GAIN	OFFSET	
ACC X	1.3631752729	0.0093273642
ACC Y	1.3562285900	-0.0086623570
ACC Z	2.7358396053	0.0174727775

* QF : value of 0 is shown for bad quality if | data - reference | > (3 * standard deviation) and > (1% of reference value)

MAGNETOMETER CALIBRATION RAW DATA VALUE					
Raw Mag X	Raw Mag Y	Raw Mag Z	Quality(Magnetic)	Quality Error(%)	QF
-0.1621	1.2632	-0.0843	53389.0742	98.8843	1
1.2405	0.2697	-0.0857	53529.2031	98.6189	1
0.1707	-1.2622	-0.0893	54134.3047	97.4729	1
-1.2427	-0.1685	-0.0880	52686.8008	99.7856	1
0.0470	1.0868	0.4088	51267.3828	97.2867	1

-0.0479	-1.0666	0.4068	51367.3626	97.2667	1
-1.0982	-0.5665	-0.3070	53254.3945	99.1394	1
0.2701	-1.0216	-0.6403	52368.3047	99.1824	1
-0.9920	-0.3106	-0.6376	51226.5664	97.0200	1
-0.1738	1.0402	-0.6485	51847.8633	98.1967	1
1.0246	0.2544	-0.6342	51825.9453	98.1552	1
-0.2197	-0.5608	0.9200	52932.6523	99.7488	1
-0.7837	-0.0929	-0.9906	54458.1367	96.8596	1

MAGNETOMETER QUALITY SUMMARY		
Average Calculated Magnetic Field	52751.7188	nT
Standard Deviation Calculated Magnetic Field	1052.5829	nT

MAGNETOMETER GAIN AND OFFSET		
	GAIN	OFFSET
MAG X	42089.3085937500	159.4645385742
MAG Y	42207.0781250000	-351.8444519043
MAG Z	46856.6171875000	3174.7180175781

Noise Level Value: 0.000219 cnts
 Noise Level Cal Value: 0.0006 g

ICT SHOP CALIBRATION

Tool Name:	ICT - 11294351	Reference Calibration Date:	13-Mar-12 12:13:20
Engineer:	R. TWEETEN	Calibration Date:	20-Nov-12 10:40:08
Software Version:	WL INSITE R3.8.0 (Build 2)	Calibration Version:	1

CALIPERS AND RINGS			
Ring	Measured	Calibrated	Units
CALIPER 1:			
Small Ring	3.69	3.65	in
Medium Ring	8.12	8.00	in
Large Ring	15.16	15.00	in
X-Large Ring	23.50	21.00	in
CALIPER 2:			
Small Ring	3.74	3.65	in
Medium Ring	8.05	8.00	in
Large Ring	15.21	15.00	in
X-Large Ring	21.07	21.00	in
CALIPER 3:			
Small Ring	3.72	3.65	in
Medium Ring	7.94	8.00	in
Large Ring	15.10	15.00	in
X-Large Ring	21.19	21.00	in
CALIPER 4:			
Small Ring	3.76	3.65	in
Medium Ring	7.92	8.00	in
Large Ring	14.91	15.00	in
X-Large Ring	20.89	21.00	in
CALIPER 5:			
Small Ring	3.61	3.65	in
Medium Ring	7.93	8.00	in
Large Ring	14.75	15.00	in
X-Large Ring	25.58	21.00	in
CALIPER 6:			

Small Ring	3.66	3.65	in
Medium Ring	8.04	8.00	in
Large Ring	15.04	15.00	in
X-Large Ring	21.00	21.00	in

DUAL LATEROLOG SHOP CALIBRATION			
Tool Name:	DLLT - 90277021	Reference Calibration Date:	05-Nov-12 17:37:07
Engineer:	Z. TAYLOR	Calibration Date:	05-Nov-12 17:44:10
Software Version:	WL INSITE R3.6.0 (Build 3)	Calibration Version:	1

Measurement	Deep Measured	Deep Calibrated	Shallow Measured	Shallow Calibrated	Units
External Cal Point #1	1.06	1.04	1.00	1.00	ohmm
External Cal Point #2	119.57	119.47	99.66	99.63	ohmm
External Cal Point #3	1539.64	1541.79	1020.27	1019.96	ohmm
External Check Point	119.58	119.48	99.66	99.63	ohmm
Internal Reference	16.04	16.01	20.17	20.17	ohmm

DUAL LATEROLOG FIELD CALIBRATION			
Tool Name:	DLLT - 90277021	Reference Calibration Date:	05-Nov-12 17:44:10
Engineer:	J. WALDEN	Calibration Date:	07-Jan-13 11:08:57
Software Version:	WL INSITE R3.8.0 (Build 2)	Calibration Version:	1

Measurement	Deep Shop	Deep Field	Shallow Shop	Shallow Field	Units
Internal Reference	16.01	16.02	20.17	20.18	ohmm
PASS/FAIL SUMMARY					
Measurement	Difference		Tolerance	Pass/Fail	
Internal Deep	0.01		+/- 0.8	Passed	
Internal Shallow	0.00		+/- 0.8	Passed	

MICRO SPHERICALLY FOCUSED LOG SHOP CALIBRATION			
Tool Name:	MSFL - 11976327	Reference Calibration Date:	05-Nov-12 18:47:05
Engineer:	Z. TAYLOR	Calibration Date:	05-Nov-12 18:49:29
Software Version:	WL INSITE R3.6.0 (Build 3)	Calibration Version:	1

Measurement	Measured	Calibrated	Units
External Cal Point #1	0.20	0.20	ohmm
External Cal Point #2	20.00	20.00	ohmm
External Cal Point #3	2001.49	2000.00	ohmm
Internal Reference	19.98	19.98	ohmm

MICRO SPHERICALLY FOCUSED LOG FIELD CALIBRATION			
Tool Name:	MSFL - 11976327	Reference Calibration Date:	05-Nov-12 18:49:29
Engineer:	R. TWEETEN	Calibration Date:	30-Nov-12 11:39:25
Software Version:	WL INSITE R3.8.0 (Build 2)	Calibration Version:	1

Measurement	Shop	Field	Change	Control Limit On	Units
Internal Reference	19.98	19.99	0.007	0.800	ohmm
<div> <div>PASS/FAIL SUMMARY</div> <div>Internal Reference: Passed</div> </div>					

CALIPER SHOP CALIBRATION			
Tool Name:	MSFL - 11976327	Reference Calibration Date:	05-Nov-12 18:34:56

Tool Name: MSFL - 11976327		Reference Calibration Date: 05-Nov-12 18:38:11	
Engineer: Z. TAYLOR		Calibration Date: 05-Nov-12 18:38:11	
Software Version: WL INSITE R3.6.0 (Build 3)		Calibration Version: 1	

	CALIBRATION RINGS AND INTERNAL			
	Measurement	Current Reading (Previous Coeff.)	Calibrated (New Coeff.)	Change
	RING DIAMETER:			
	Ring #1 (in)	8.40	8.25	0.1500
	Ring #2 (in)	15.00	15.00	0.0000
	Hi/Lo Internal:			
	Lo Internal (in)	4.17	4.17	0.0000
	Hi Internal (in)	19.10	19.10	0.0000


CALIPER FIELD CALIBRATION			
Tool Name: MSFL - 11976327		Reference Calibration Date: 05-Nov-12 18:38:11	
Engineer: J. WALDEN		Calibration Date: 07-Jan-13 11:10:09	
Software Version: WL INSITE R3.8.0 (Build 2)		Calibration Version: 1	

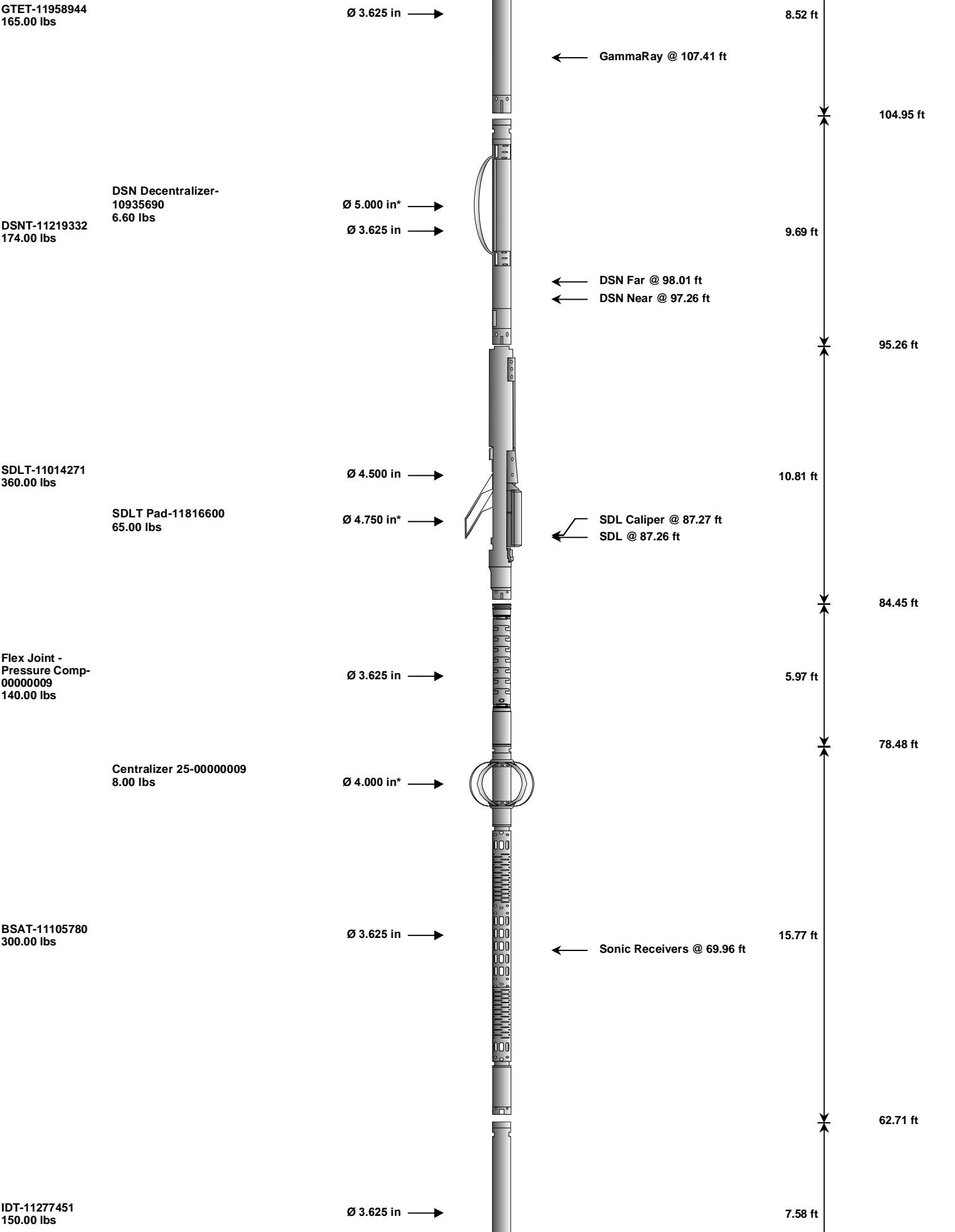
	MEASURED CALIPER VALUES				
	Measurement	Shop	Field	Change	Control Limit On New Value
	Lo Internal (in)	4.17	3.93	0.238	+/- 0.500
	Hi Internal (in)	19.10	19.20	-0.099	+/- 0.500
PASS/FAIL SUMMARY					
Lo Internal Check:			Passed		
Hi Internal Check:			Passed		

CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11958944						
Gamma Ray Calibrator	234.0	234.4	-----	-0.4	+/- 9.00	api
DSNT-11219332						
Snow-Block Porosity	0.0766	0.0745	-----	0.0021	+/- 0.0150	decg
SDLT-11014271						
Pad Extension	3.75	3.82	-----	-0.07	+/-0.10	in
Ring Diameter	8.25	8.17	-----	0.08	+/-0.15	in
SDLT Pad-11816600						
Near(B+D+P+L)	1709.502	1709.182	-----	0.320	+/-16.593	cps
Far(B+D+P+L)	1127.718	1126.210	-----	1.508	+/-17.664	cps
ICT-11294351						
Caliper 1	8.00	-----	-----	0.00	-----	in
Caliper 2	8.00	-----	-----	0.00	-----	in
Caliper 3	8.00	-----	-----	0.00	-----	in
Caliper 4	8.00	-----	-----	0.00	-----	in
Caliper 5	8.00	-----	-----	0.00	-----	in
Caliper 6	8.00	-----	-----	0.00	-----	in
DLLT-90277021						
Deep Internal Ref.	16.01	16.02	-----	-0.01	+/- 0.8	ohmm
Shallow Internal Ref.	20.17	20.18	-----	-0.01	+/- 0.8	ohmm
MSFL-11976327						
MSFL Internal Ref.	19.98	19.99	-----	-0.01	+/- 0.800	ohmm
Caliper Lo. Internal	4.17	3.93	-----	0.24	+/- 0.500	in
Caliper Hi. Internal	19.10	19.20	-----	-0.10	+/- 0.500	in

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
						156.96 ft
RWCH-11732195 135.00 lbs		Ø 3.625 in →		← Load Cell @ 153.28 ft ← BH Temperature @ 152.71 ft	6.25 ft	
						150.71 ft
SP Sub-11616670 60.00 lbs		Ø 3.625 in →		← SP @ 148.93 ft	3.74 ft	
						146.97 ft
Return Electrode- 11603107 57.00 lbs		Ø 3.625 in →			2.50 ft	
						144.47 ft
Isolator Assy.- 11253527 274.00 lbs		Ø 3.625 in →			15.00 ft	
						129.47 ft
Isolator Assy.- 00000032 274.00 lbs		Ø 3.625 in →			15.00 ft	
						114.47 ft
Barrier Sub- 11253527 38.00 lbs		Ø 3.625 in →			1.00 ft	
						113.47 ft



ICT-11294351
330.00 lbs

Ø 3.625 in →

12.83 ft

55.12 ft

Centralizer 25-00000014
8.00 lbs

Ø 4.000 in* →

42.29 ft

DLLT-90277021
390.00 lbs

Ø 3.625 in →

31.63 ft

← DLLT Sonde @ 19.41 ft

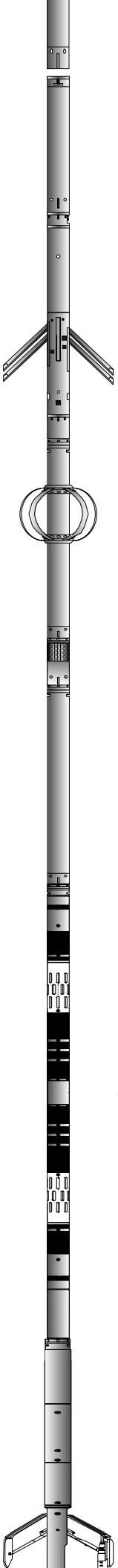
10.66 ft

MSFL-11976327
214.00 lbs

Ø 4.000 in →

10.33 ft

MSFL Pad @ 2.75 ft



Bull Nose-00000009
5.00 lbs

Ø 2.750 in →



0.33 ft



0.33 ft

0.00 ft

Mnemonic		Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head		11732195	135.00	6.25	150.71	300.00
SP	SP Sub		11616670	60.00	3.74	146.97	300.00
RE	Return Electrode - Rigid Bridle		11603107	57.00	2.50	144.47	300.00
ISA	Isolator Assembly - Rigid Bridle		11253527	274.00	15.00	129.47	300.00
ISA	Isolator Assembly - Rigid Bridle		00000032	274.00	15.00	114.47	300.00
w	Barrier Sub - Rigid Bridle		11253527	38.00	1.00	113.47	300.00
GTET	Gamma Telemetry Tool		11958944	165.00	8.52	104.95	60.00
DSNT	Dual Spaced Neutron		11219332	174.00	9.69	95.26	60.00
DCNT	DSN Decentralizer		10935690	6.60	5.13	* 98.59	300.00
SDLT	Spectral Density Tool		11014271	360.00	10.81	84.45	60.00
SDLP	Density Insite Pad		11816600	65.00	2.55	* 86.66	60.00
FLEX	Flex Joint - Pressure Compensated		00000009	140.00	5.97	78.48	300.00
BSAT	Borehole Sonic Array Tool		11105780	300.00	15.77	62.71	60.00
OBCEN	Centralizer - 25 in. Overbody		00000009	8.00	2.08	* 75.87	300.00
IDT	Insite Directional Tool		11277451	150.00	7.58	55.12	30.00
ICT	Six Independent Arm Caliper		11294351	330.00	12.83	42.29	30.00
DLLT	Dual Laterolog		90277021	390.00	31.63	10.66	100.00
OBCEN	Centralizer - 25 in. Overbody		00000014	8.00	2.08	* 38.59	300.00
MSFL	Micro Spherically Focused Log		11976327	214.00	10.33	0.33	60.00
BLNS	Bull Nose		00000009	5.00	0.33	0.00	300.00
Total				3,153.60	156.96		
* Not included in Total Length and Length Accumulation.							
Data: SORS_1P\0001 GTET-DSNT-SDLT-BSAT-DLLT-MSFLVDLE							
Date: 08-Jan-13 05:51:00							

COMPANY	CHAMA OIL & MINERALS LLC		
WELL	SORS-1P		
FIELD	WILDCAT		
COUNTY	WASHINGTON	STATE	CO
HALLIBURTON		DUAL LATEROLOG, MICRO-SPHERICALLY FOCUSED LOG, DUAL SPACED NEUTRON, SPECTRAL DENSITY, BOREHOLE SONIC LOG	