HALLIBURTON

ARRAY COMPENSATED TRUE RESISTIVITY LOG

COMPANY RUSSELL OIL, INC.
WELL ROHLEDER TRUST #28-1
FIELD/BLOCK WILDCAT
COUNTY LOGAN
STATE KANSAS

COMPANY **RUSSELL OIL, INC.**

WELL **ROHLEDER TRUST #28-1**

FIELD/BLOCK **WILDCAT**

COUNTY **LOGAN** STATE **KANSAS**

API No. 15-109-21591-00-00

Location
(SHL) SE SE NW NW
1105' FNL & 1090' FWL

Sect. 28 Twp. 11S Rge. 32W

Other Services:
ACRT
SDL-DSN
MICLOG

Permanent Datum	GL		Elev. 3079.0 ft	Elev.: K.B.	3084.0 ft
Log measured from	KB		5.0 ft above perm. Datum	D.F.	3082.0 ft
Drilling measured from	KB			G.L.	3079.0 ft

Date		05-May-19					
Run No.		1					
Depth - Driller		4770.0 ft					
Depth - Logger		4770.0 ft					
Bottom - Logged Interval		4760					
Top - Logged Interval		312					
Casing - Driller		8.625 in	@ 312.0 ft	@		@	
Casing - Logger		312.0 ft					
Bit Size		7.875 in		@		@	
Type Fluid in Hole		Water Based Mud					
Density	Viscosity	9.20 g/cc	65.00 s/qt				
PH	Fluid Loss	11.00 pH	6.2 cptm				
Source of Sample		FLOWLINE					
Rm @ Meas. Temperature		1.04 ohmm	@ 74.00 degF	@		@	
Rmf @ Meas. Temperature		0.83 ohmm	@ 72.00 degF	@		@	
Rmc @ Meas. Temperature		1.22 ohmm	@ 72.00 degF	@		@	
Source Rmf	Rmc	MEAS	MEAS				
Rm @ BHT		0.60 ohmm	@ 133.0 degF	@		@	
Time Since Circulation		22:00 hr					
Time on Bottom		05-May-19 01:46					
Max. Rec. Temperature		133.00 degF	@ 4770.0 ft	@		@	
Equipment	Location	12156883	EL RENO, OK				
Recorded By		WHITLOCK					
Witnessed By		KITT NOAH					

Fold here

Service Ticket No.: 905677175

API No.: 15-109-21591-00-00

PGM Version: WL INSITE R6.0.8 (Build 3)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

RESISTIVITY SCALE CHANGES

	Type Log	Depth	Scale Up Hole	Scale Down Hole
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 EQUIPMENT DATA

	Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other
	@	@	@	@	@
	@	@	@	@	@
	@	@	@	@	@
	@	@	@	@	@
	@	@	@	@	@
	@	@	@	@	@

EQUIPMENT DATA

	GAMMA	ACOUSTIC	DENSITY	NEUTRON
Run No.				
Serial No.				
Model No.				
Diameter				
Detector Model No.		No. of Cent.		
Type		Spacing	Log Type	
Length		LSA [Y/N]	Source Type	
Distance to Source		FWDA [Y/N]	Serial No.	
			Strength	

LOGGING DATA

	GENERAL			GAMMA		ACOUSTIC		DENSITY		NEUTRON	
	Run No.	Depth From	Depth To	Speed ft/min	Scale L	Scale R	Matrix	Scale L	Scale R	Matrix	Scale L	Scale R	Matrix

DIRECTIONAL INFORMATION

Maximum Deviation	@	KOP	@

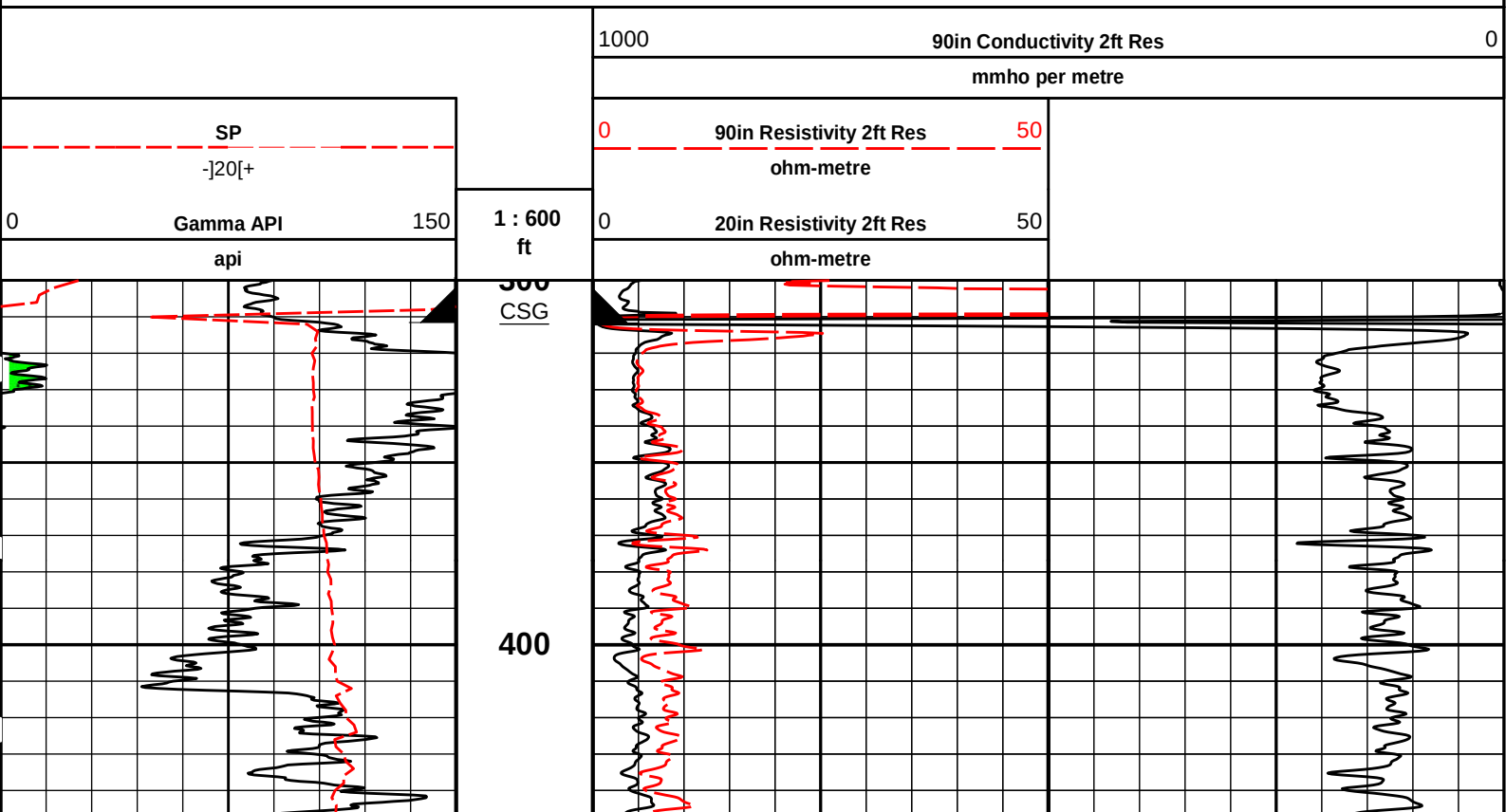
Remarks: 5 1/2" CASING USED FOR ANNULAR HOLE VOLUME

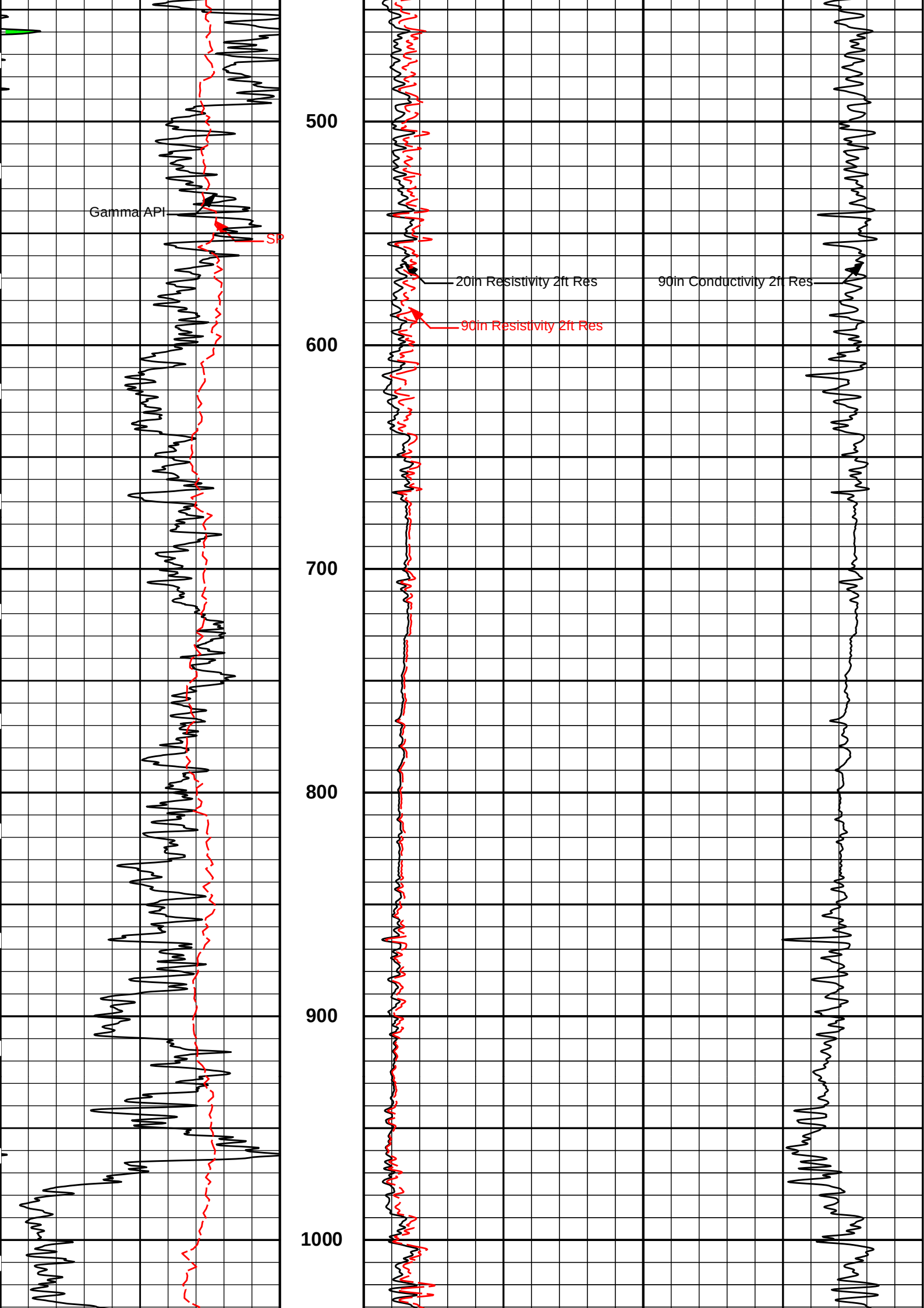
HALLIBURTON

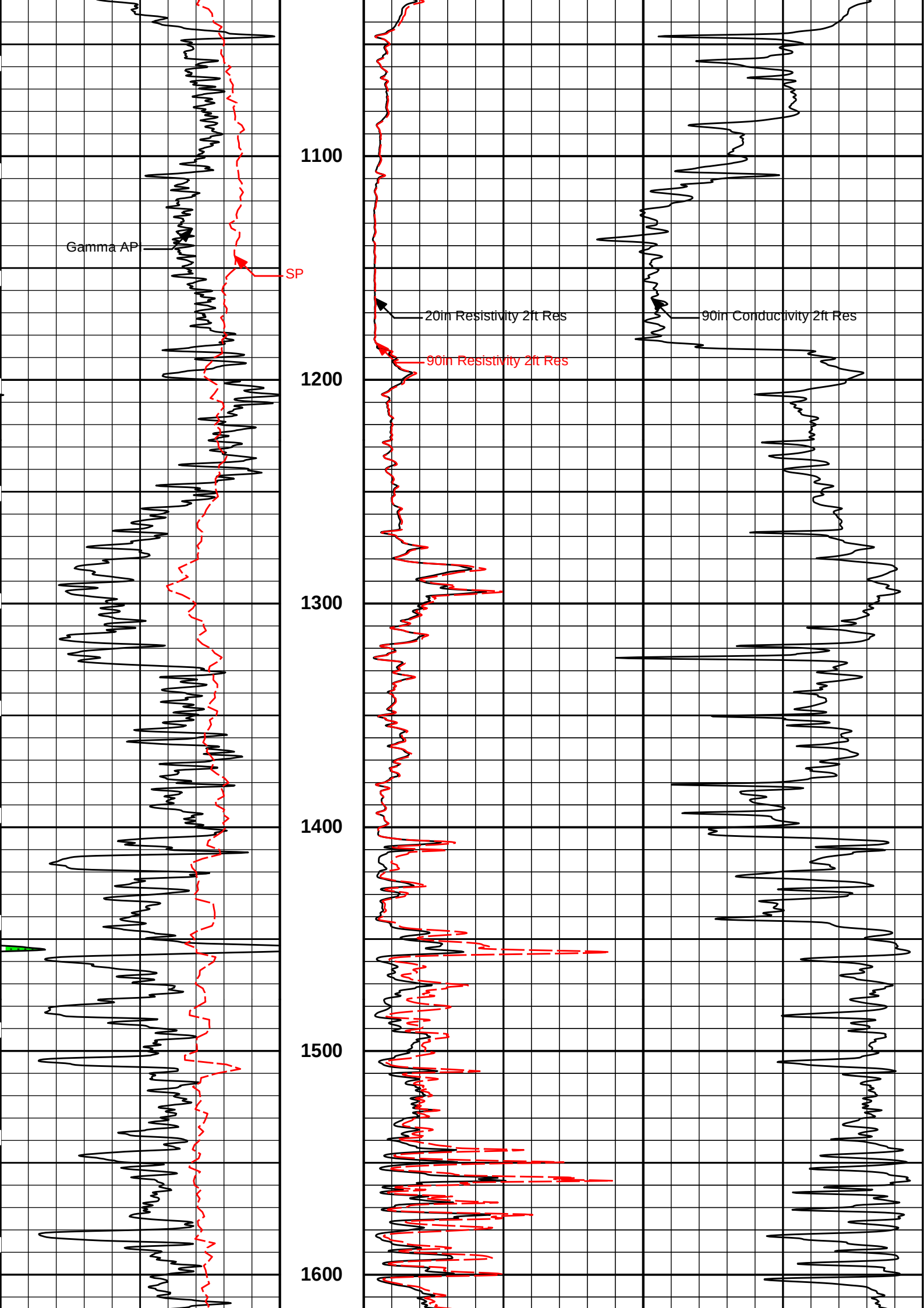
Plot Time: 05-May-19 04:24:45
Plot Range: 300 ft to 4776.5 ft
Data: RUSSEL_ROHLEDER\Well Based\DAQ-0001-004
Plot File: \\-LOCAL-\RUSSEL_ROHLEDER\0001 SP_GTET-DSN-SDL-ACRT\ACRT\ACRT_2_main

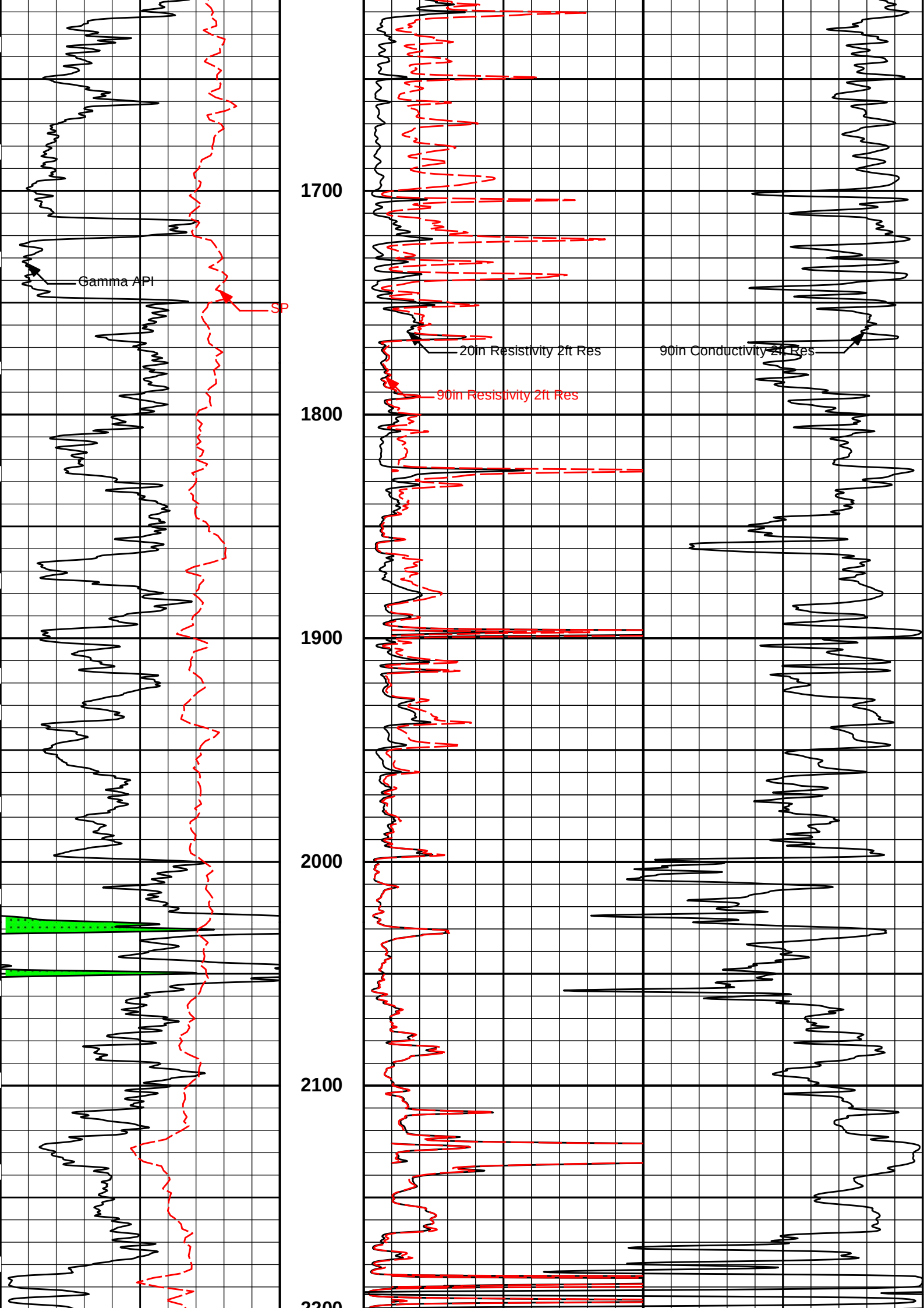
2 INCH MAIN LOG

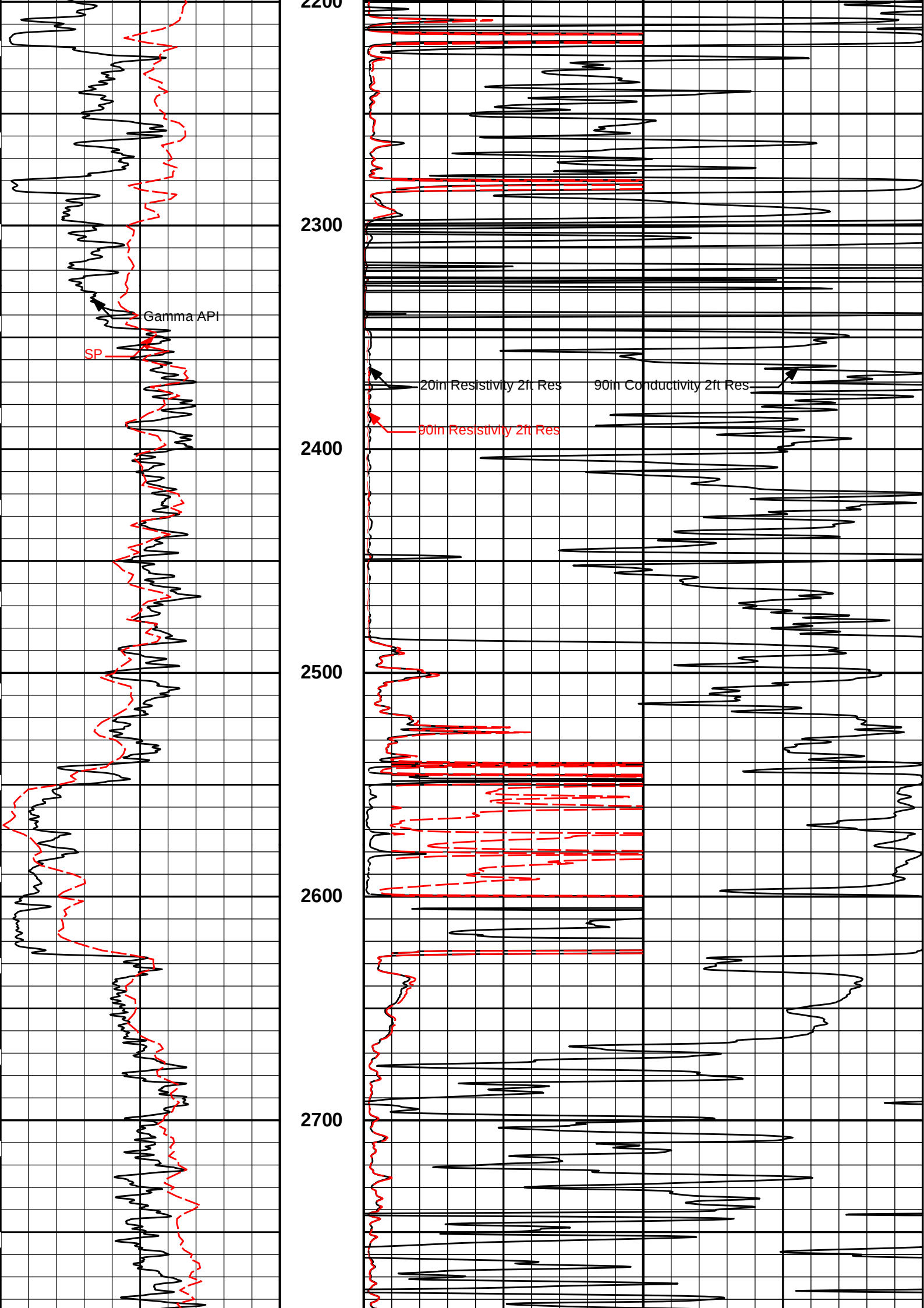
2 INCH MAIN LOG

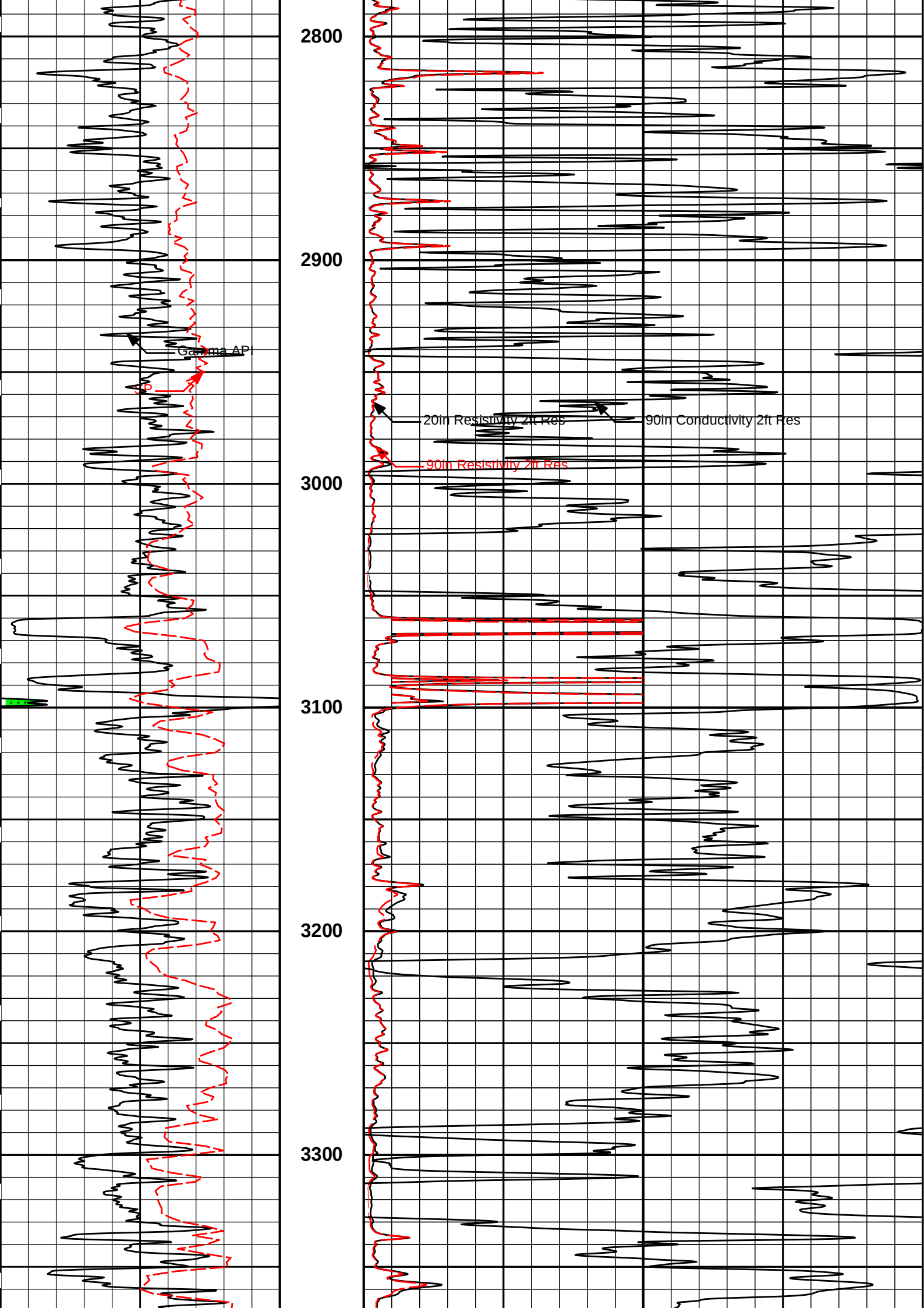


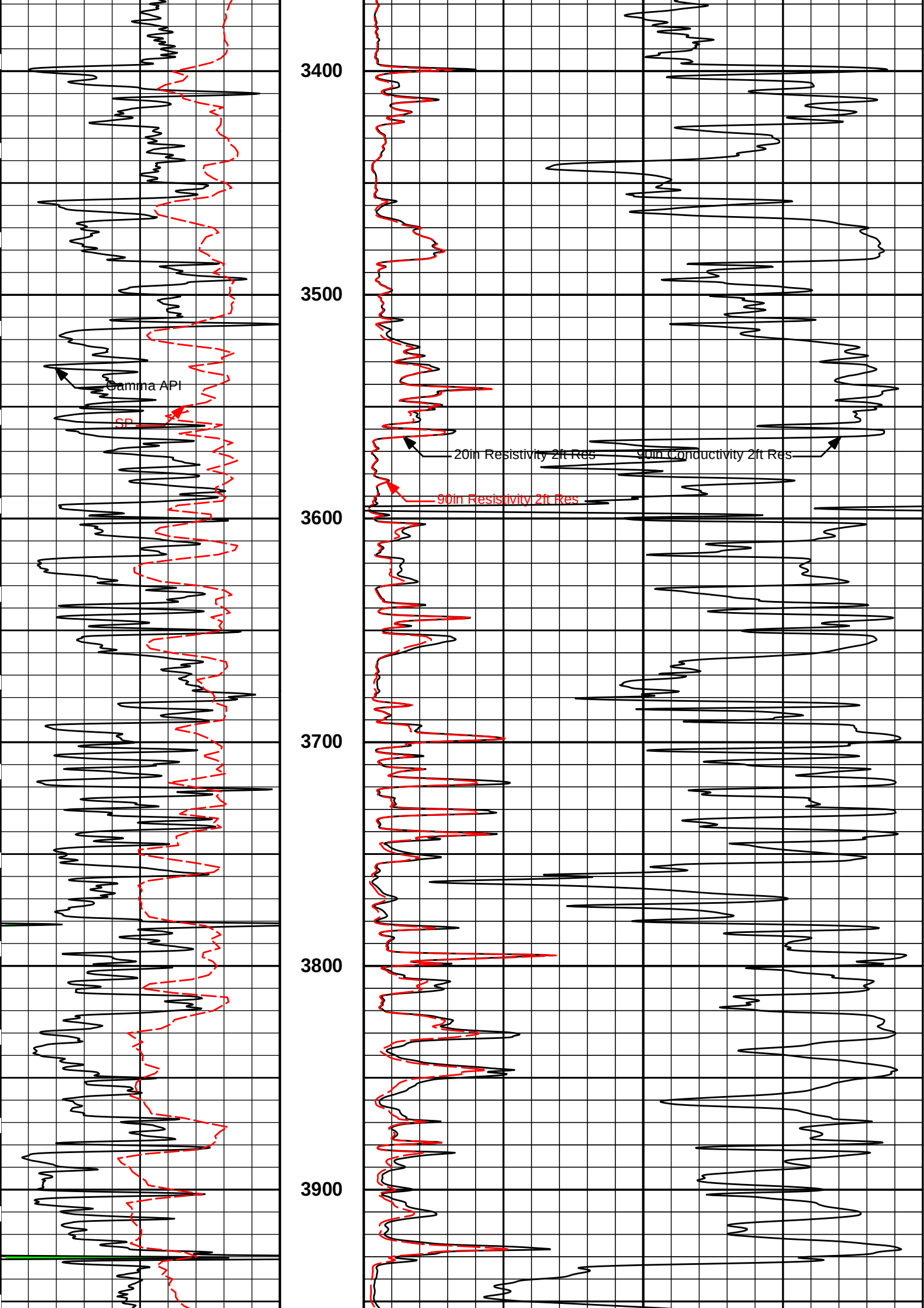

Gamma API
SP
20in Resistivity 2ft Res
90in Resistivity 2ft Res
90in Conductivity 2ft Res
500
600
700
800
900
1000

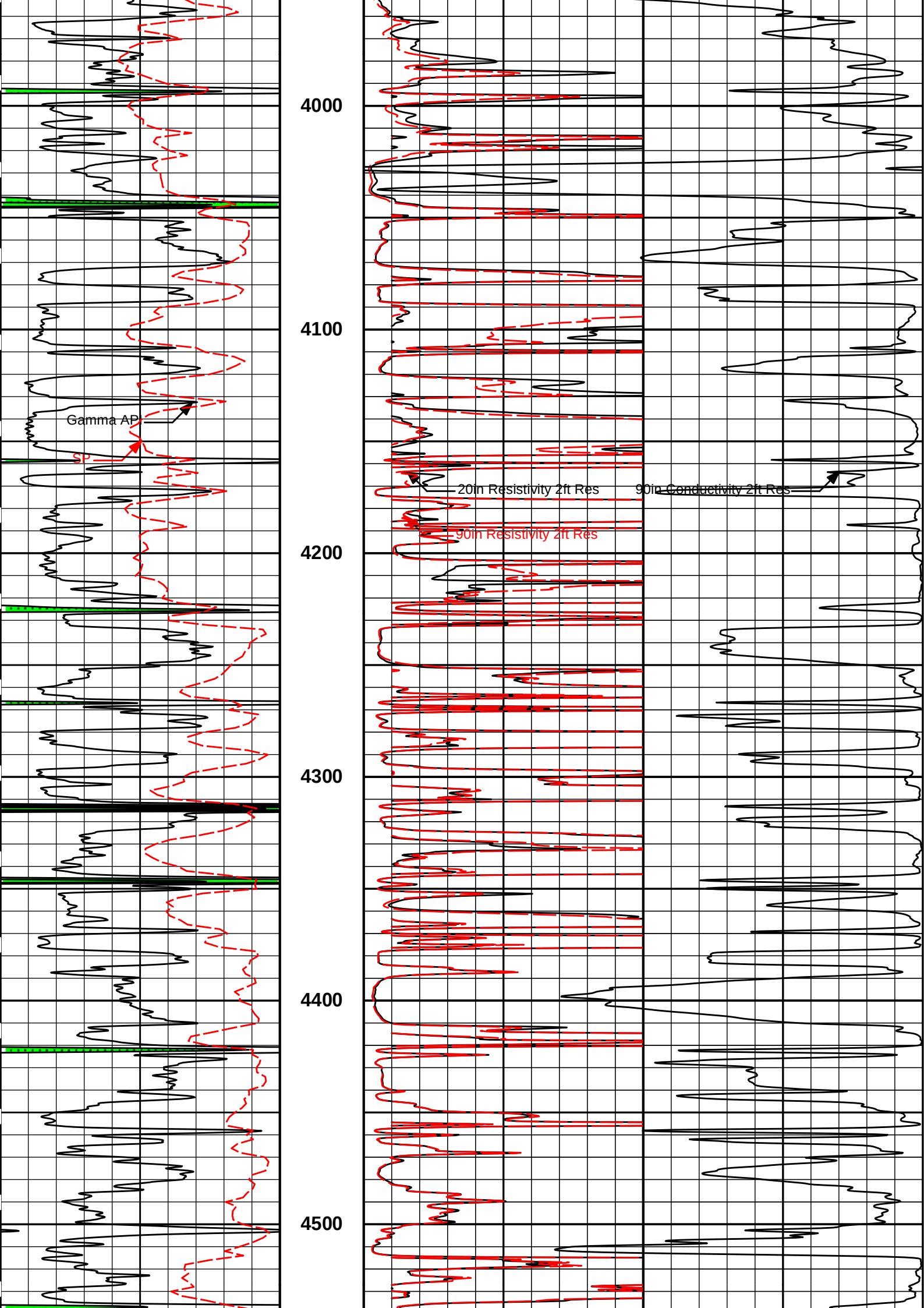

1100
1200
1300
1400
1500
1600
Gamma API
SP
20in Resistivity 2ft Res
90in Resistivity 2ft Res
90in Conductivity 2ft Res

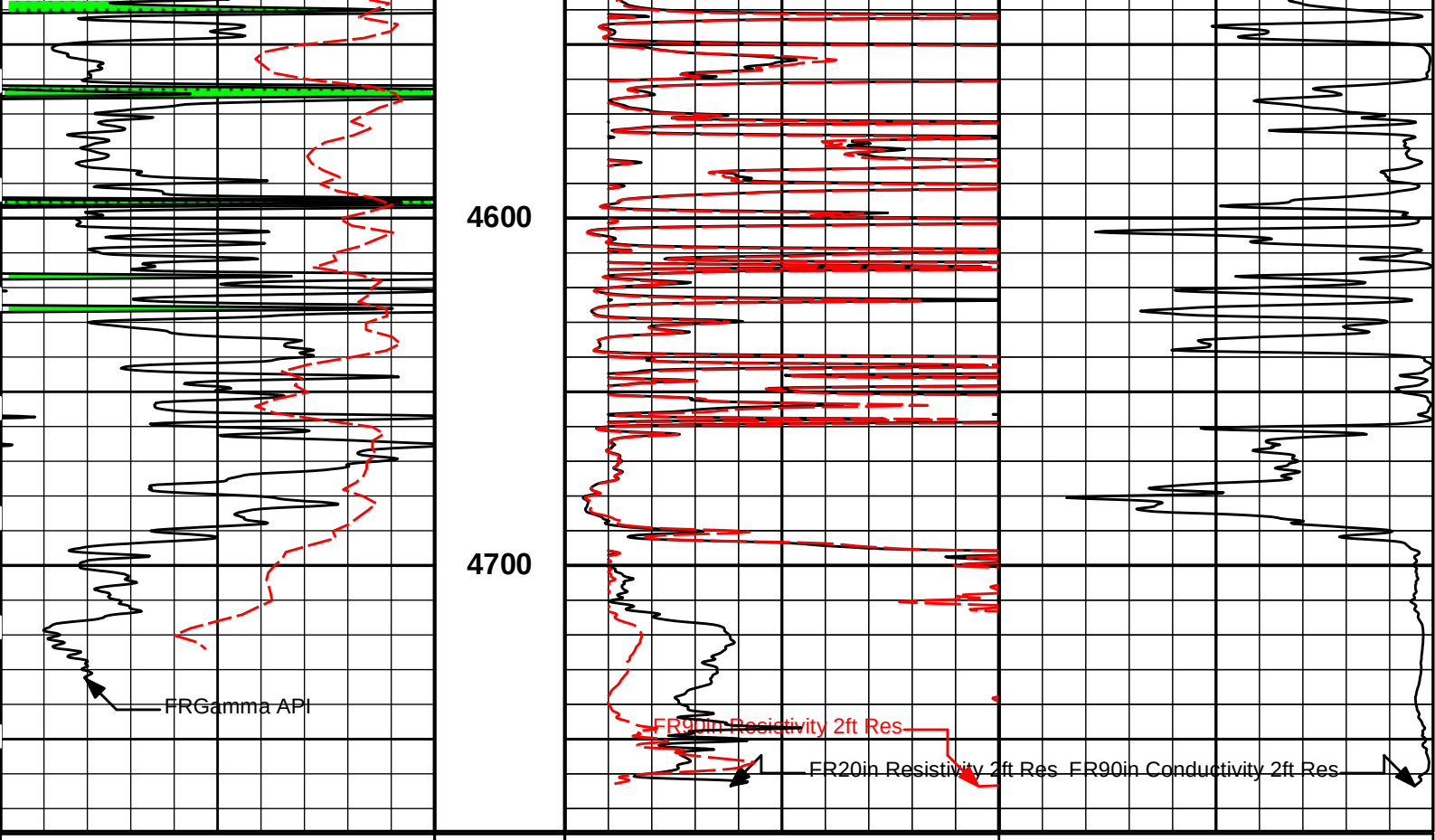

Gamma API
SP
20in Resistivity 2ft Res
90in Conductivity 2ft Res
90in Resistivity 2ft Res
1700
1800
1900
2000
2100
2200


2200
2300
2400
2500
2600
2700
Gamma API
SP
20in Resistivity 2ft Res
90in Conductivity 2ft Res
90in Resistivity 2ft Res


2800
2900
3000
3100
3200
3300
Gamma API
20in Resistivity 2ft Res
90in Conductivity 2ft Res
90in Resistivity 2ft Res


3400
3500
3600
3700
3800
3900
Gamma API
SP
20in Resistivity 2ft Res
90in Conductivity 2ft Res
90in Resistivity 2ft Res


4000
4100
4200
4300
4400
4500
Gamma API
SP
20in Resistivity 2ft Res
90in Resistivity 2ft Res
90in Conductivity 2ft Res



0 Gamma API 150	1 : 600 ft	0 20in Resistivity 2ft Res 50
api		ohm-metre
SP		0 90in Resistivity 2ft Res 50
-]20[+		ohm-metre
		1000 90in Conductivity 2ft Res 0
		mmho per metre

HALLIBURTON

Plot Time: 05-May-19 04:24:48
Plot Range: 300 ft to 4776.5 ft
Data: RUSSEL_ROHLEDER\Well Based\DAQ-0001-004\
Plot File: \\-LOCAL-\RUSSEL_ROHLEDER\0001 SP_GTET-DSN-SDL-ACRT\ACRT\ACRT_2_main

2 INCH MAIN LOG

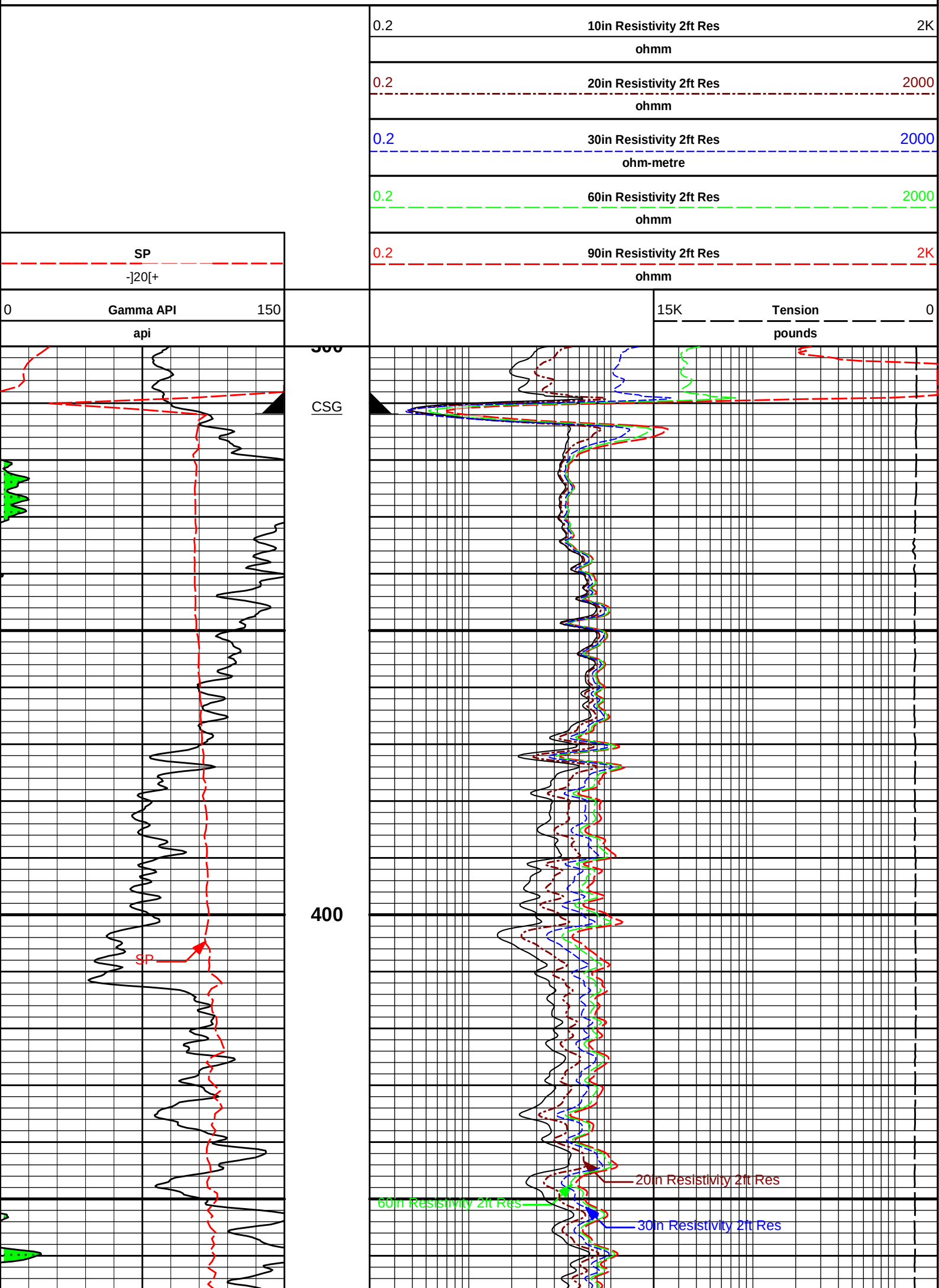
2 INCH MAIN LOG

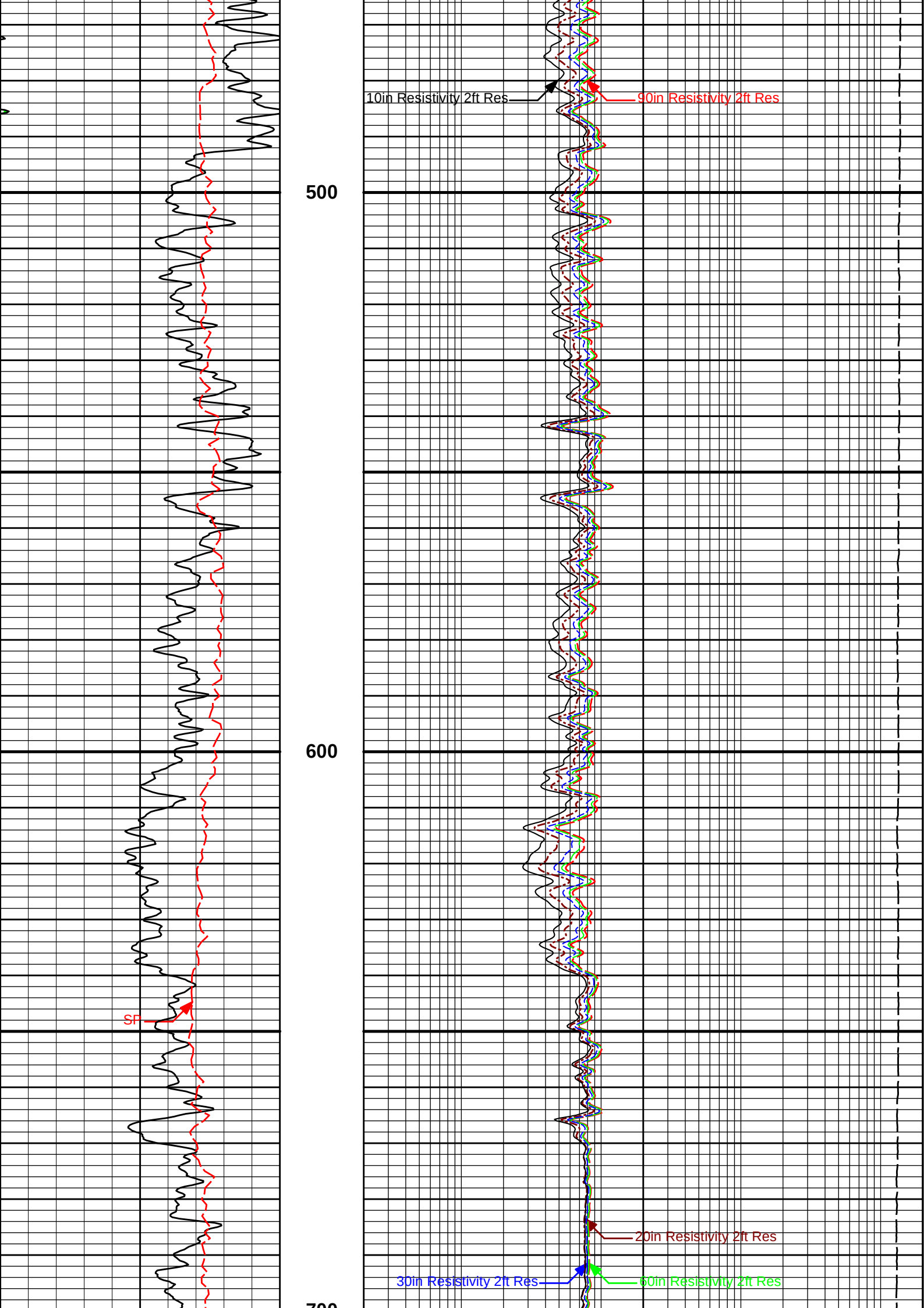
HALLIBURTON

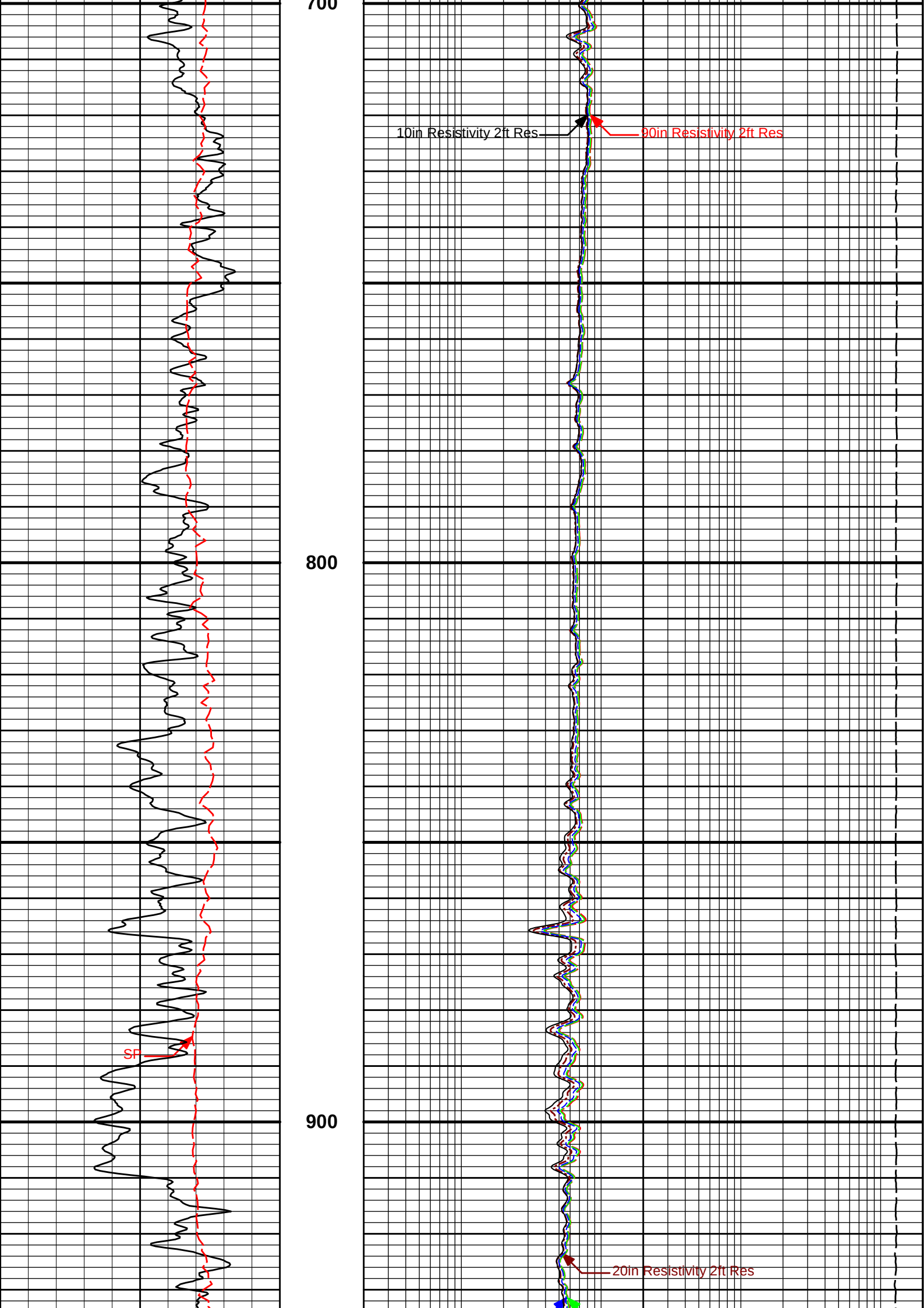
Plot Time: 05-May-19 04:24:48
Plot Range: 300 ft to 4776.5 ft
Data: RUSSEL_ROHLEDER\Well Based\DAQ-0001-004\
Plot File: \\-LOCAL-\RUSSEL_ROHLEDER\0001 SP_GTET-DSN-SDL-ACRT\ACRT\ACRT_5inch_main

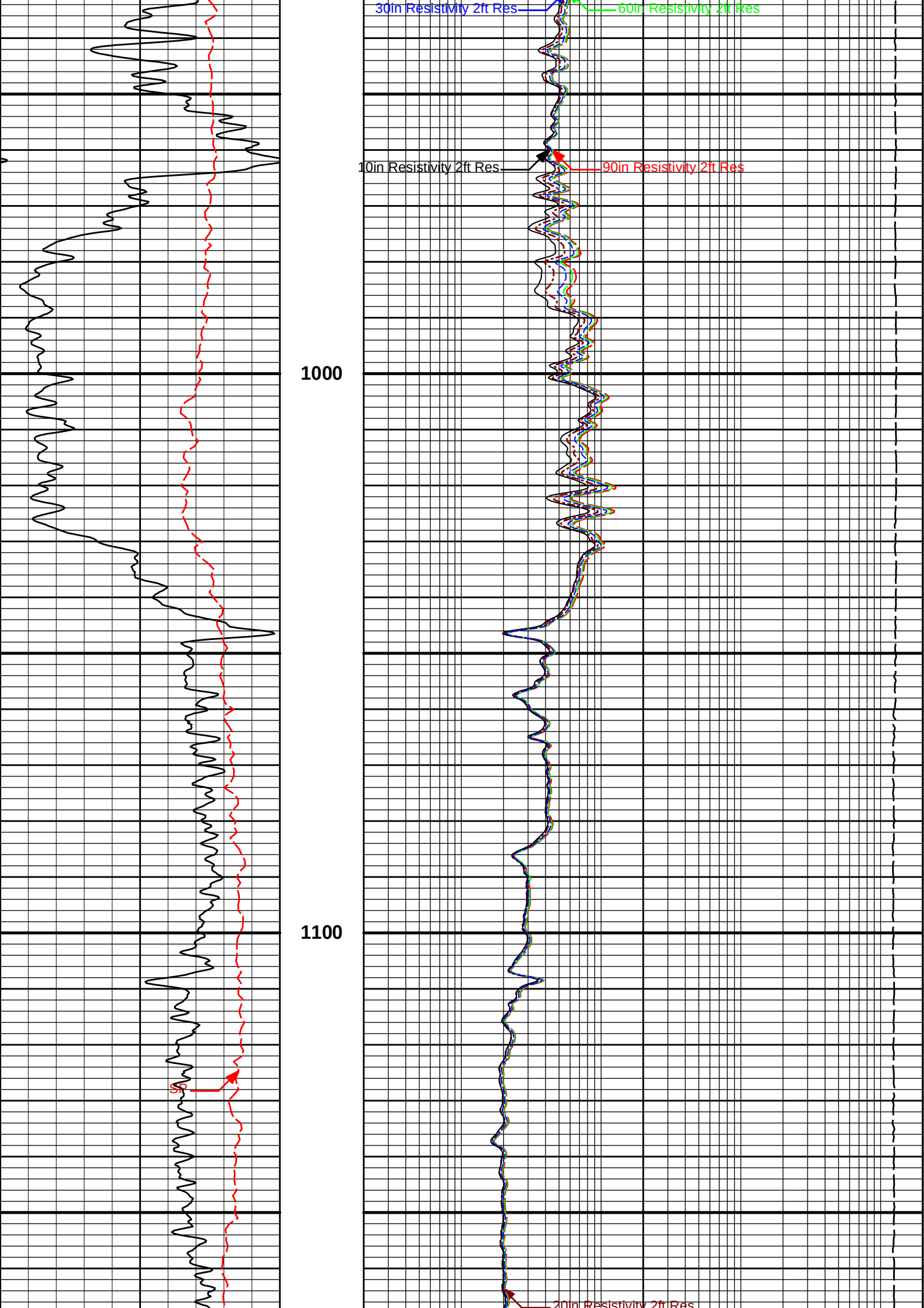
5 INCH MAIN LOG

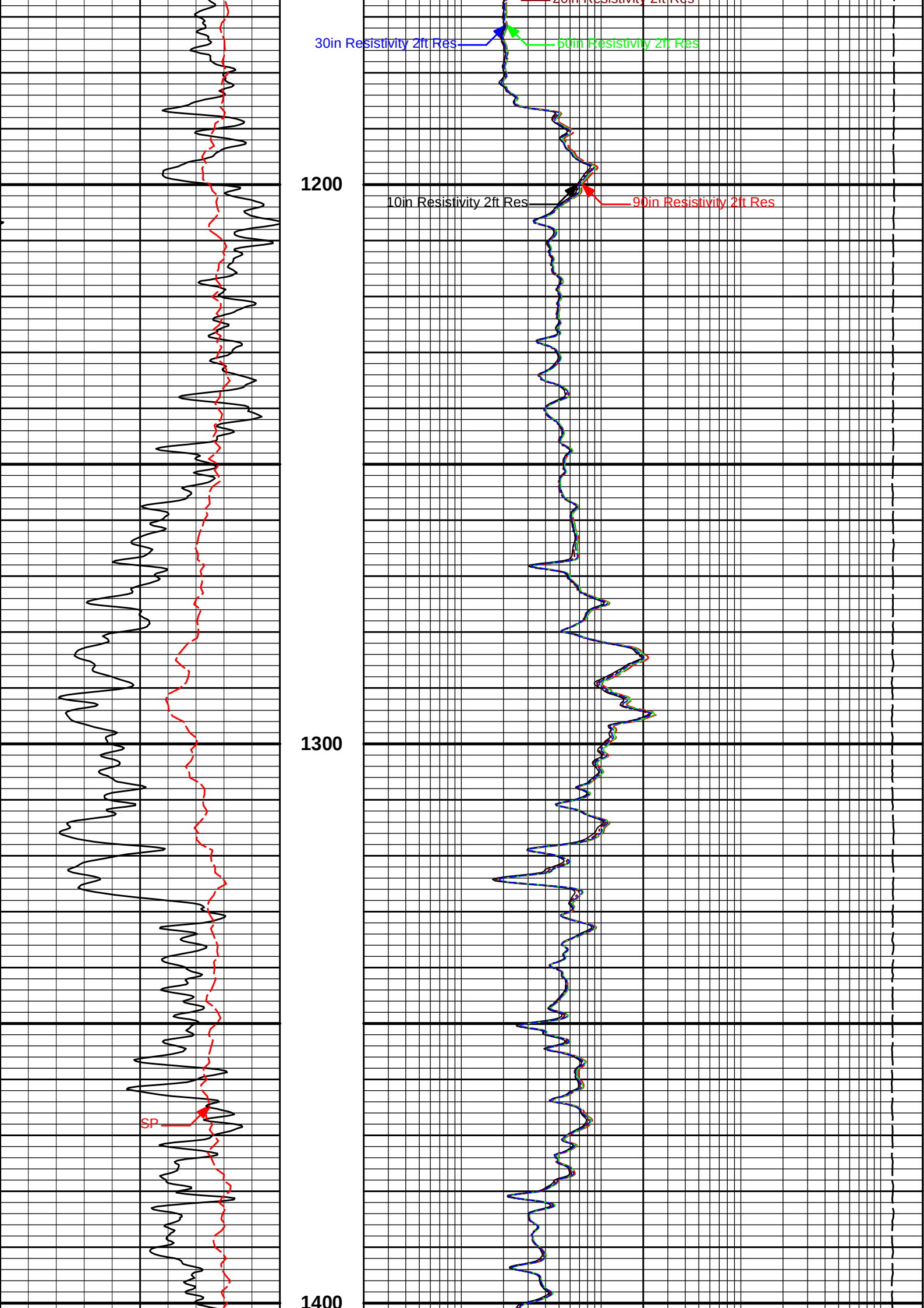
5 INCH MAIN LOG

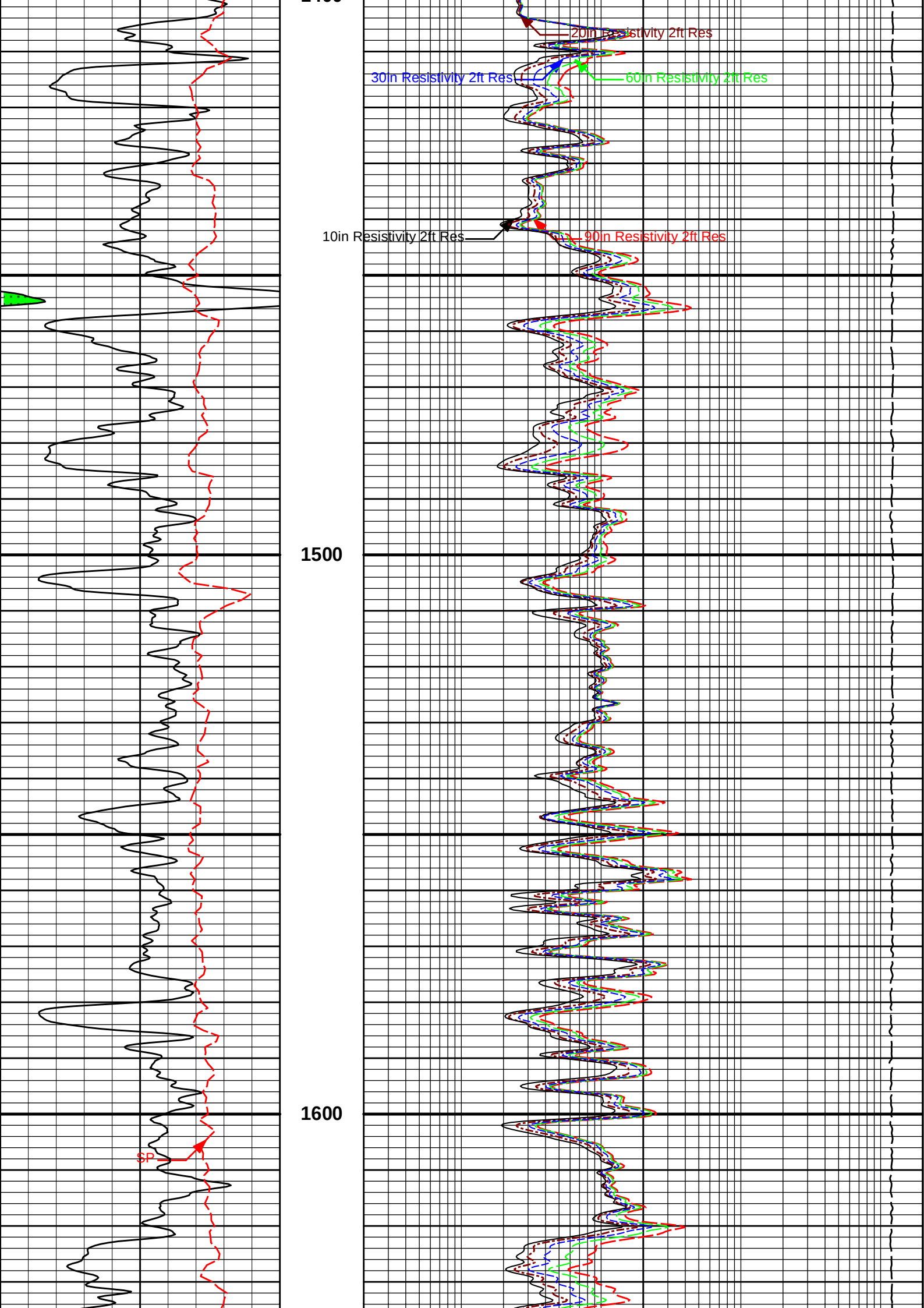

0.2
10in Resistivity 2ft Res
2K
ohmm
0.2
20in Resistivity 2ft Res
2000
ohmm
0.2
30in Resistivity 2ft Res
2000
ohm-metre
0.2
60in Resistivity 2ft Res
2000
ohmm
0.2
90in Resistivity 2ft Res
2K
ohmm
SP
-]20[+
0
Gamma API
150
api
15K
Tension
0
pounds
CSG
400
SP
20in Resistivity 2ft Res
60in Resistivity 2ft Res
30in Resistivity 2ft Res

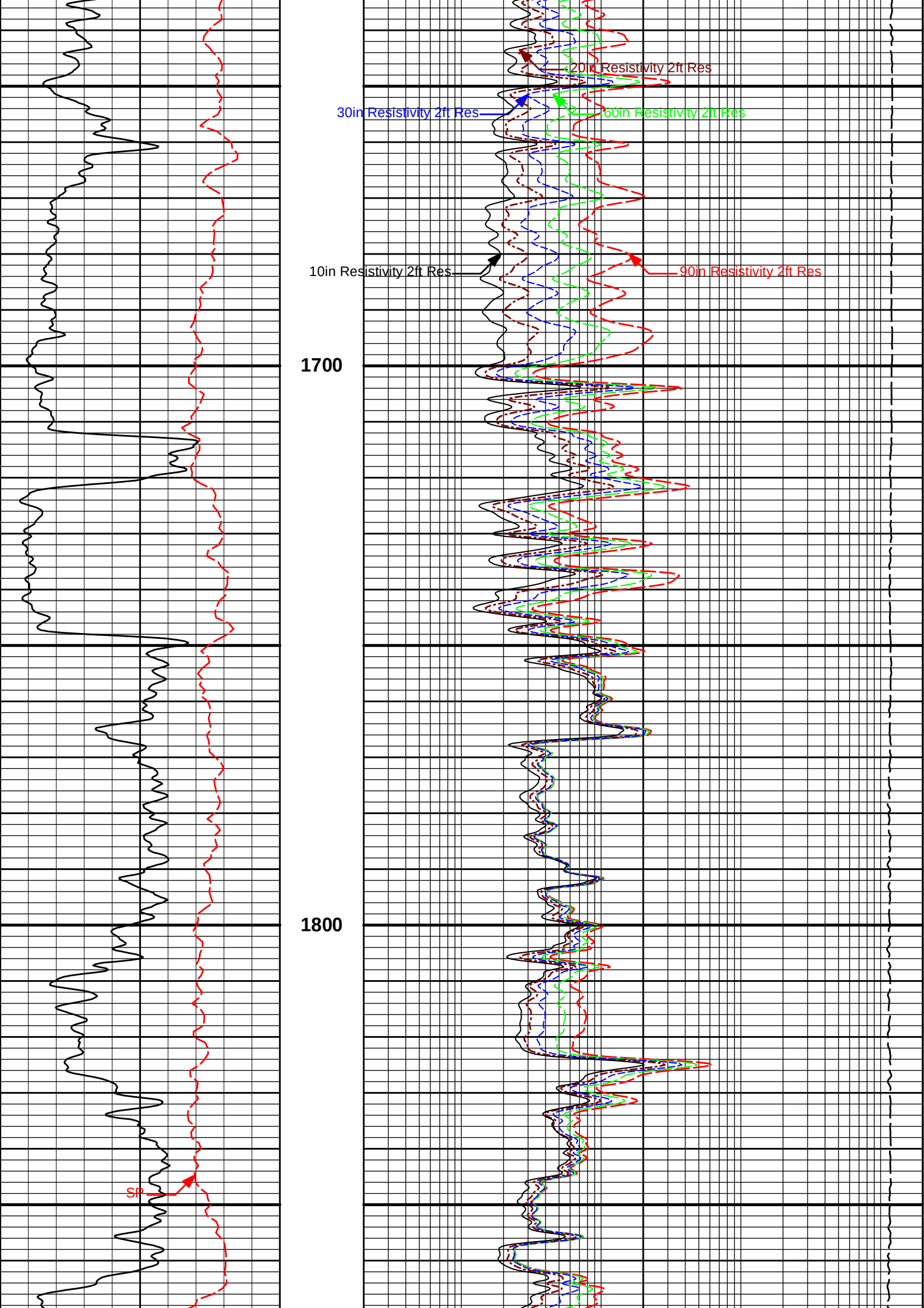

10in Resistivity 2ft Res
90in Resistivity 2ft Res
500
600
SP
20in Resistivity 2ft Res
30in Resistivity 2ft Res
60in Resistivity 2ft Res

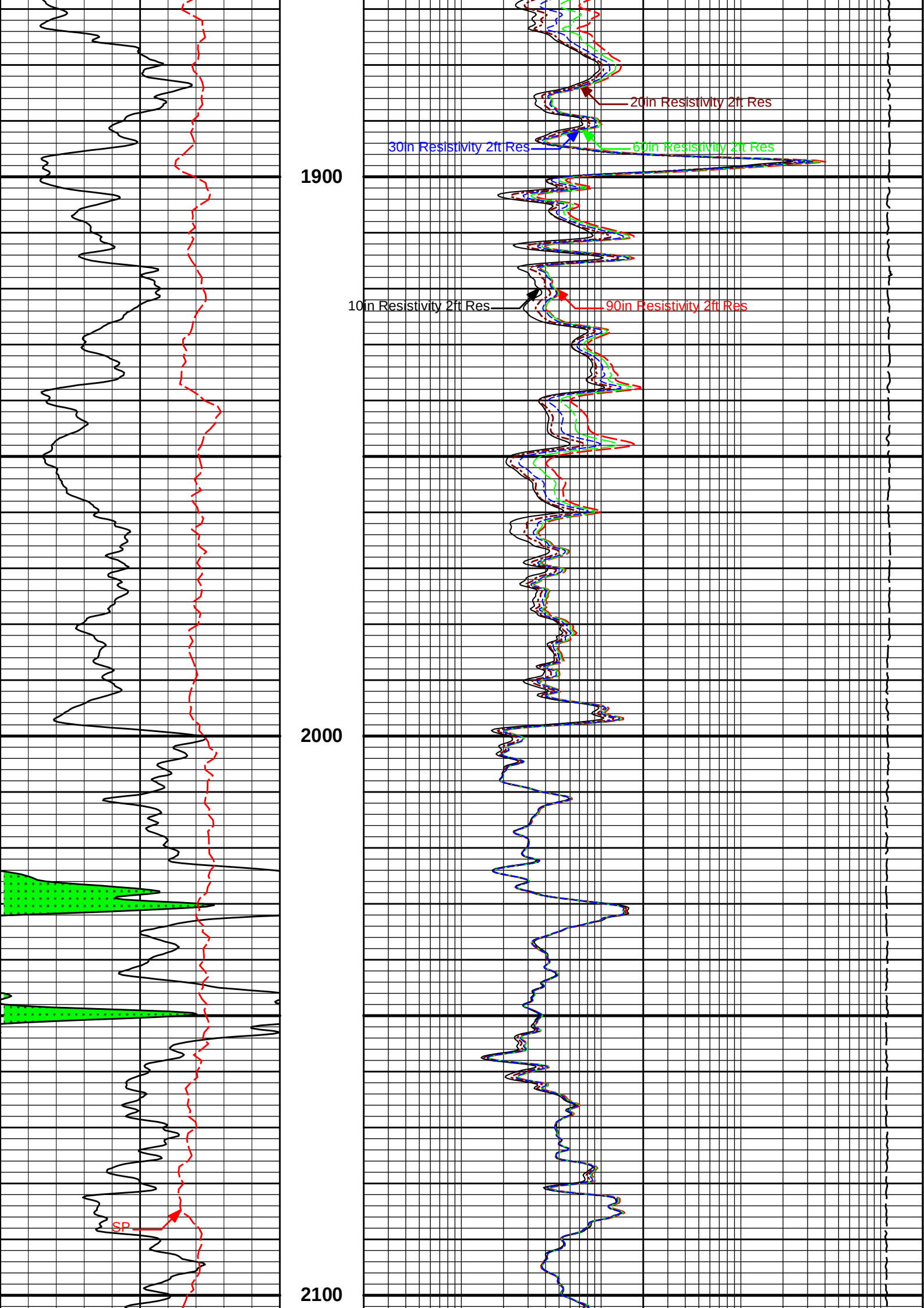

700
800
900
10in Resistivity 2ft Res
90in Resistivity 2ft Res
20in Resistivity 2ft Res
SP

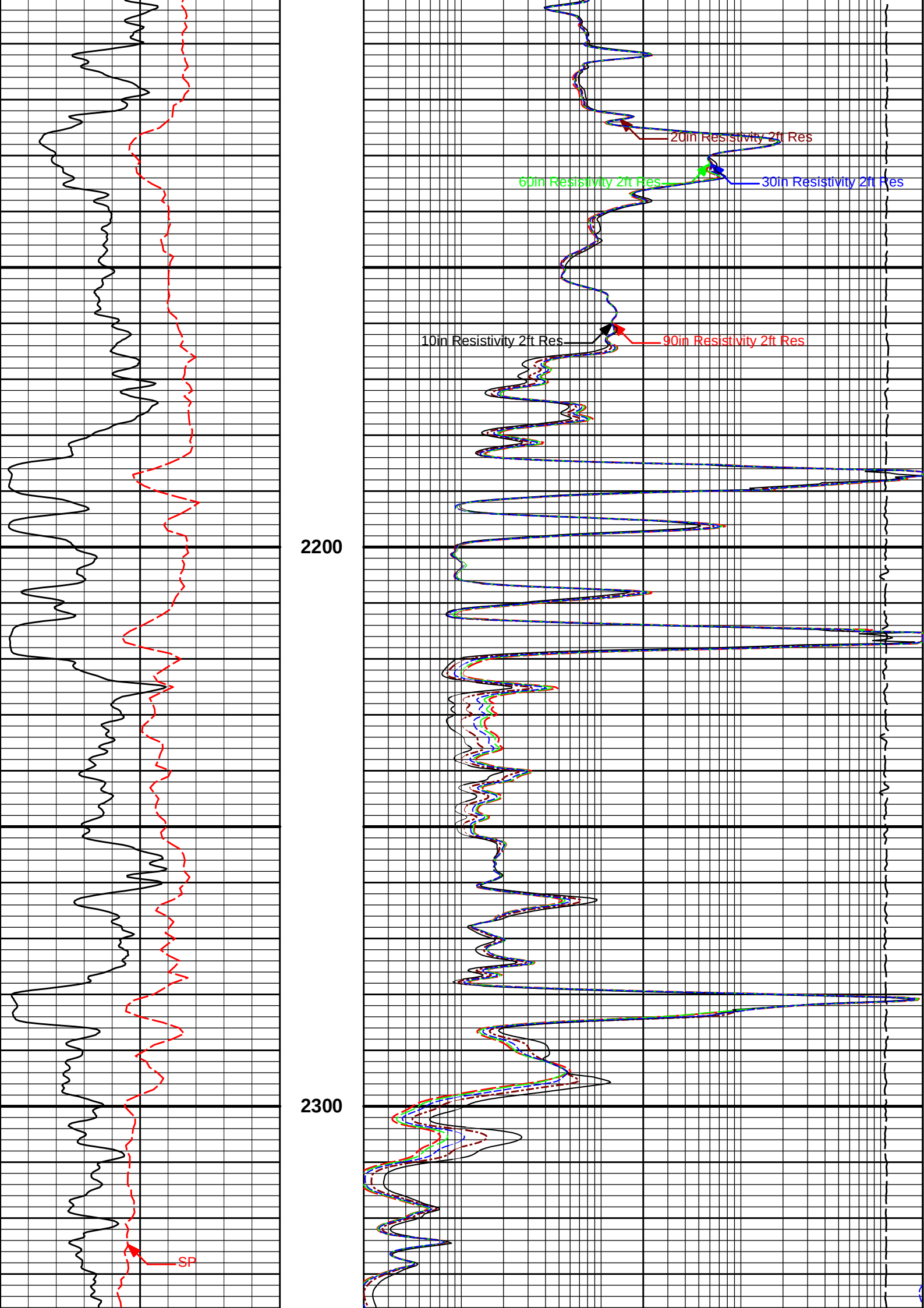

30in Resistivity 2ft Res
60in Resistivity 2ft Res
10in Resistivity 2ft Res
90in Resistivity 2ft Res
1000
1100
20in Resistivity 2ft Res

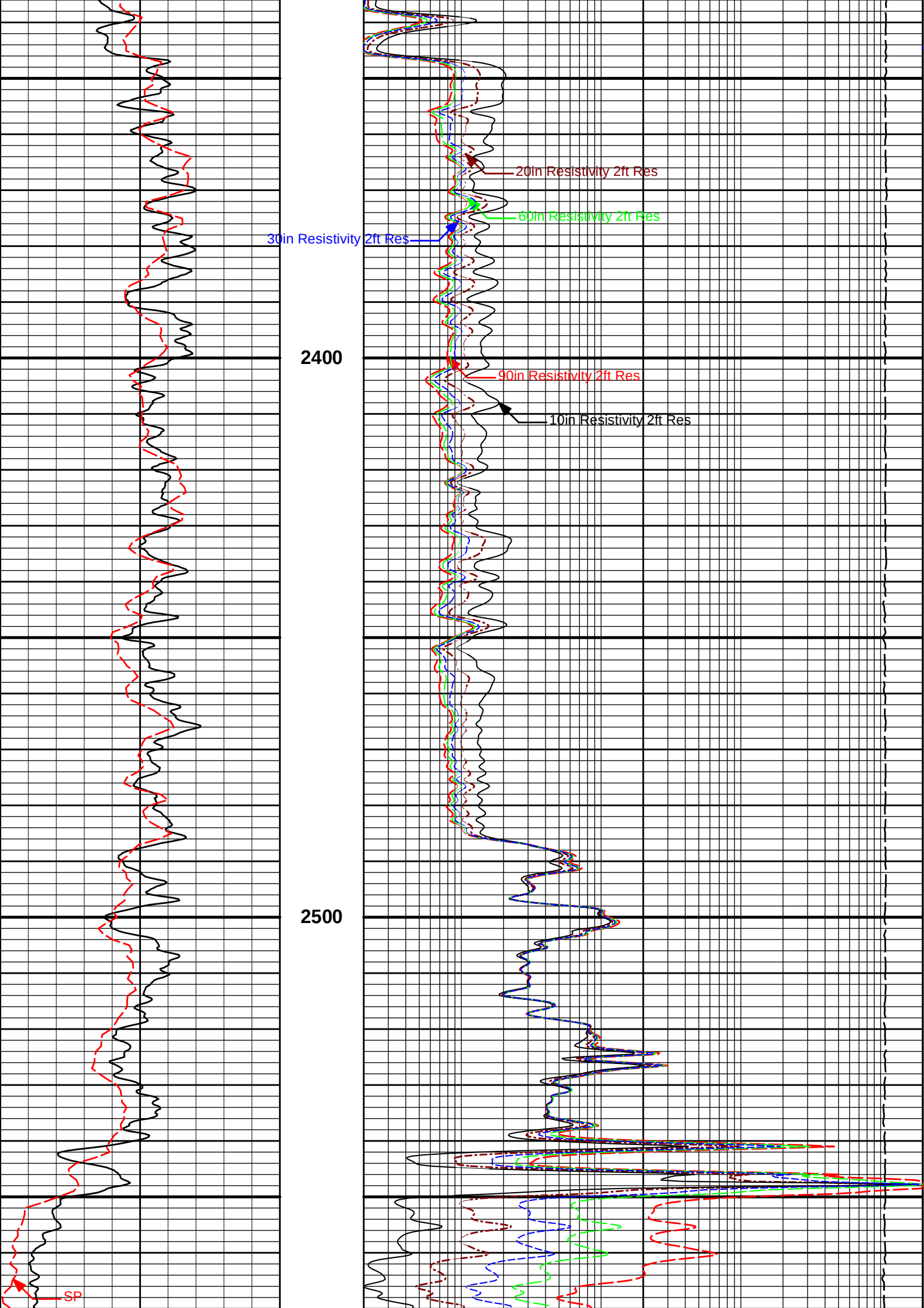

30in Resistivity 2ft Res
60in Resistivity 2ft Res
1200
10in Resistivity 2ft Res
90in Resistivity 2ft Res
1300
SP
1400

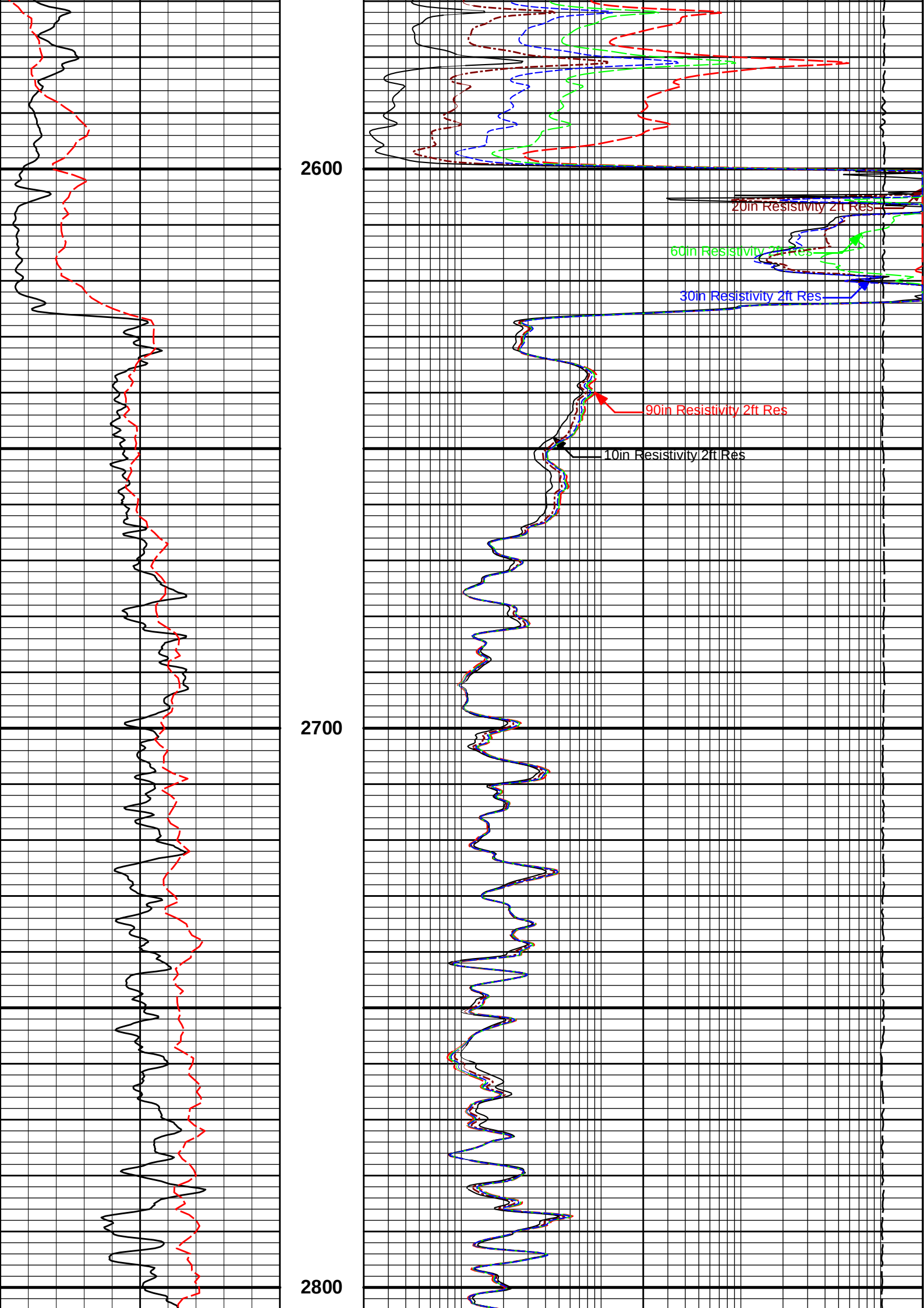

20in Resistivity 2ft Res
30in Resistivity 2ft Res
60in Resistivity 2ft Res
10in Resistivity 2ft Res
90in Resistivity 2ft Res
1500
1600
SP

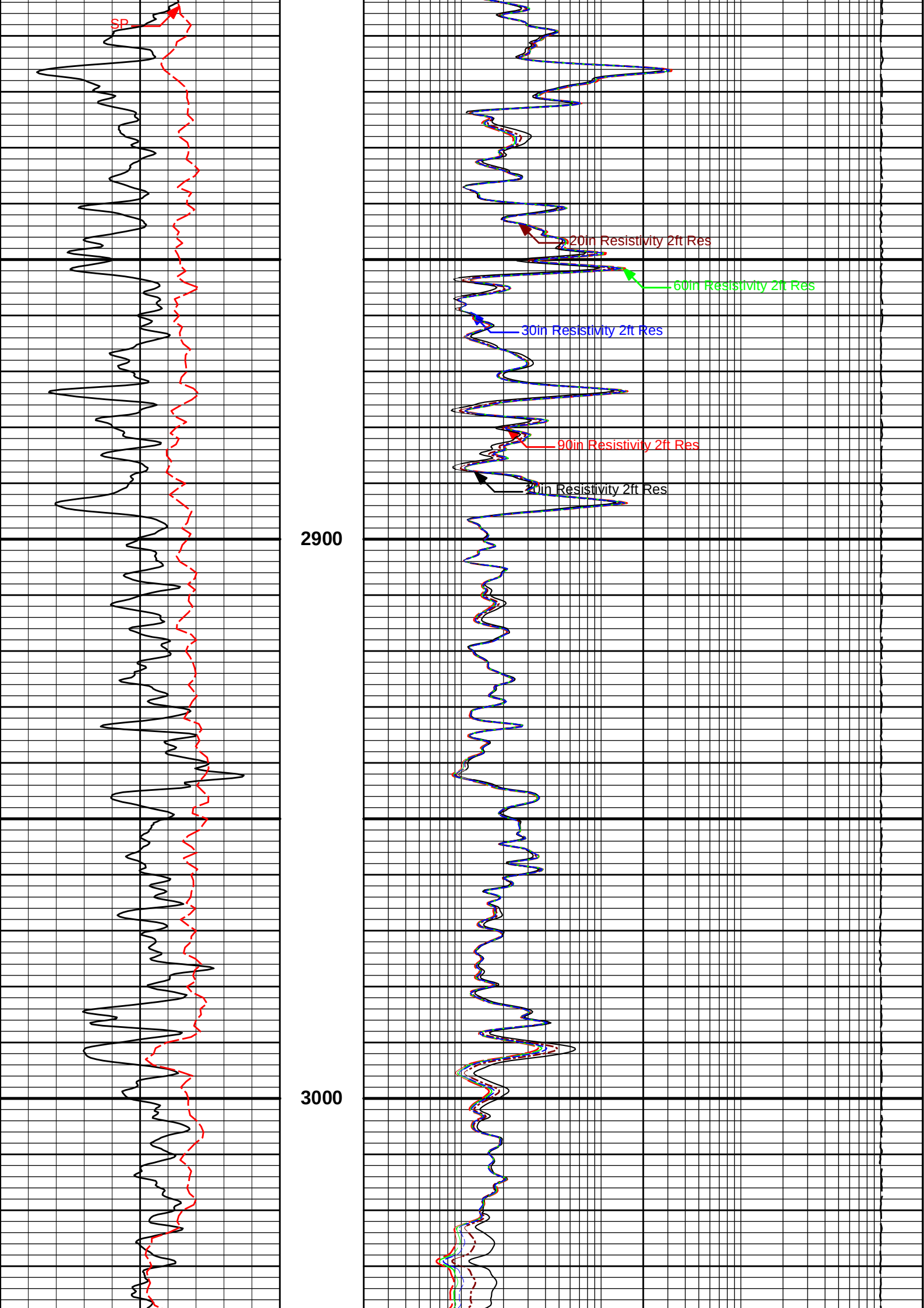

20in Resistivity 2ft Res
30in Resistivity 2ft Res
60in Resistivity 2ft Res
10in Resistivity 2ft Res
90in Resistivity 2ft Res
1700
1800
SP

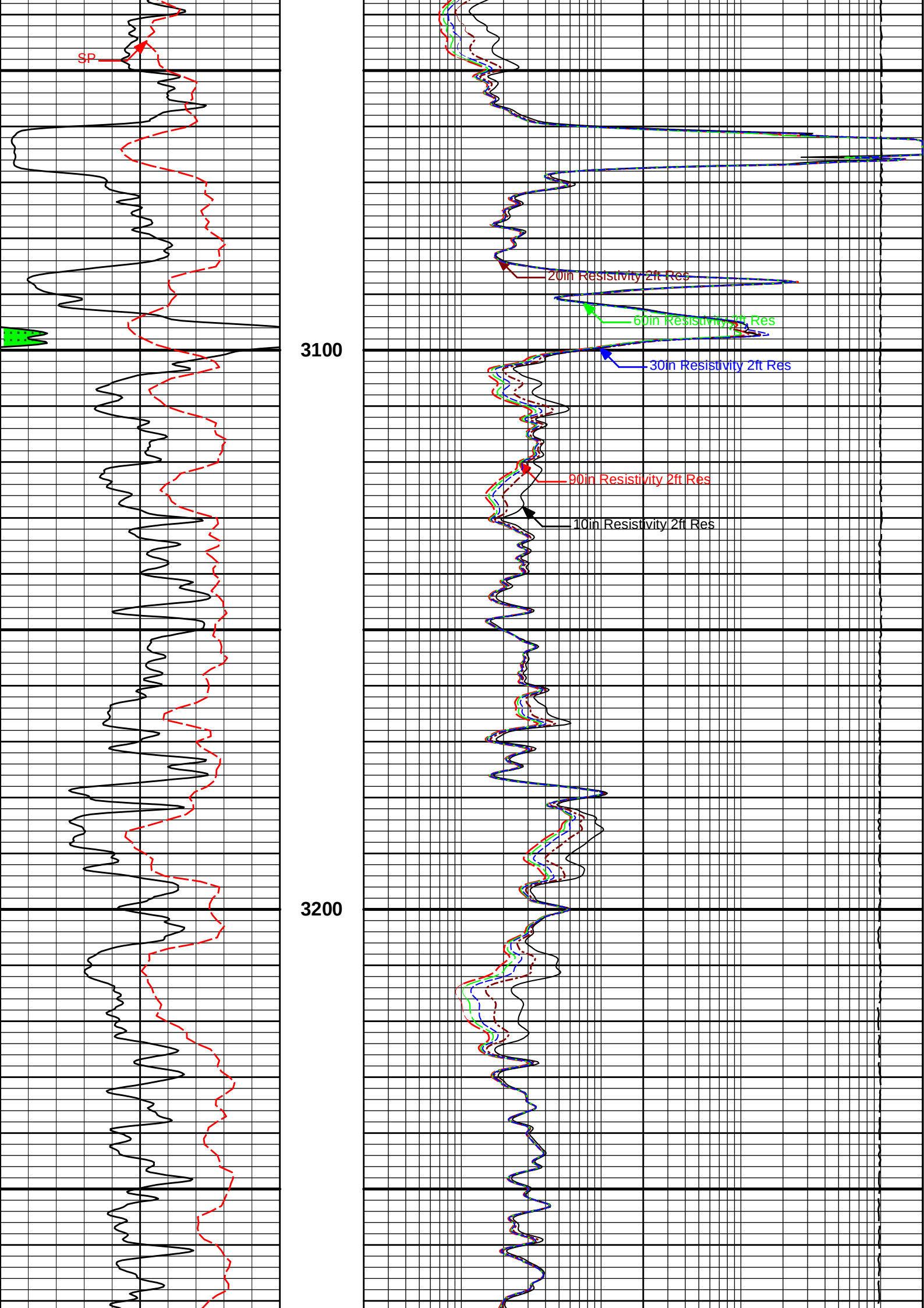

20in Resistivity 2ft Res
30in Resistivity 2ft Res
60in Resistivity 2ft Res
1900
10in Resistivity 2ft Res
90in Resistivity 2ft Res
2000
SP
2100

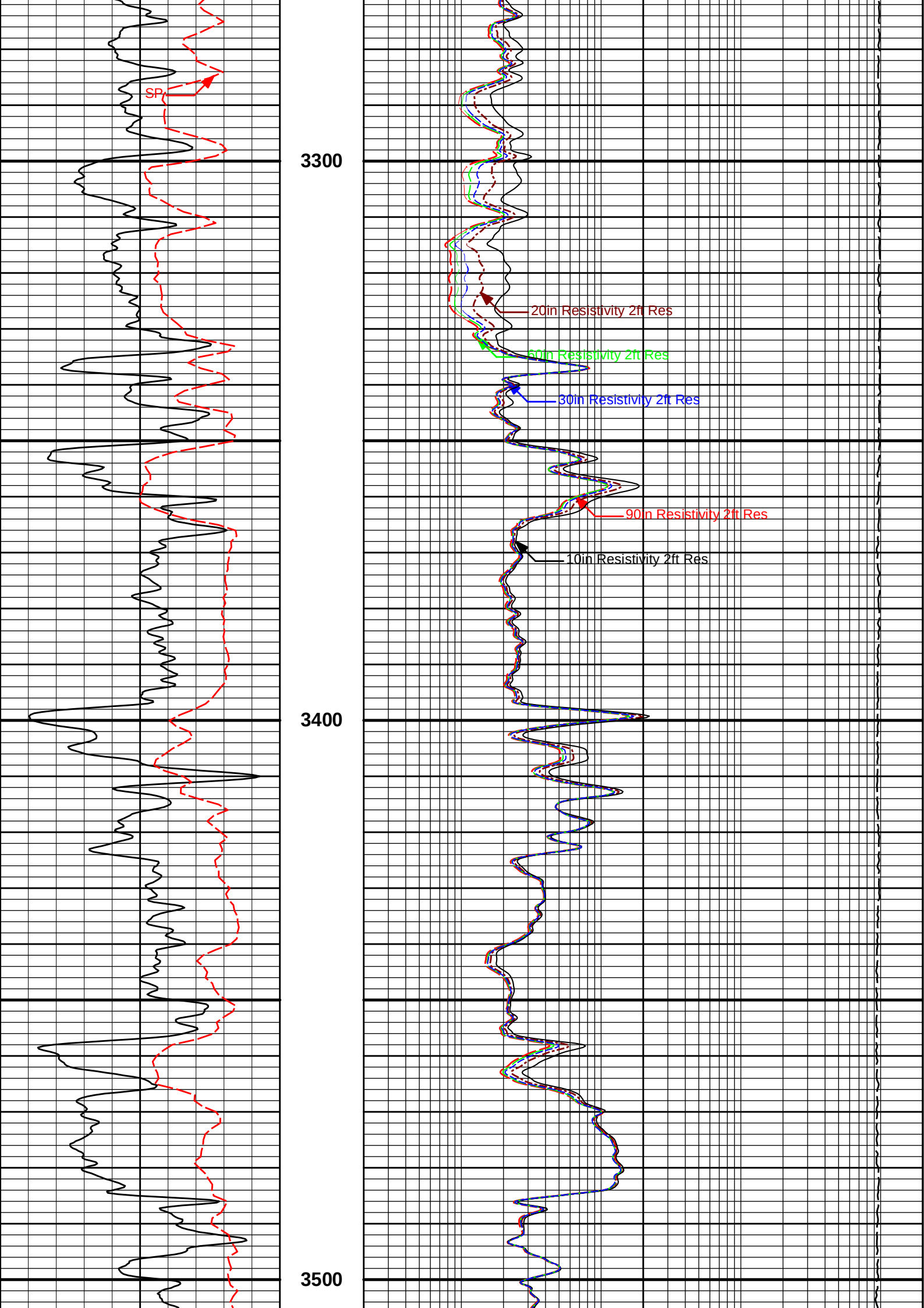

20in Resistivity 2ft Res
60in Resistivity 2ft Res
30in Resistivity 2ft Res
10in Resistivity 2ft Res
90in Resistivity 2ft Res
2200
2300
SP

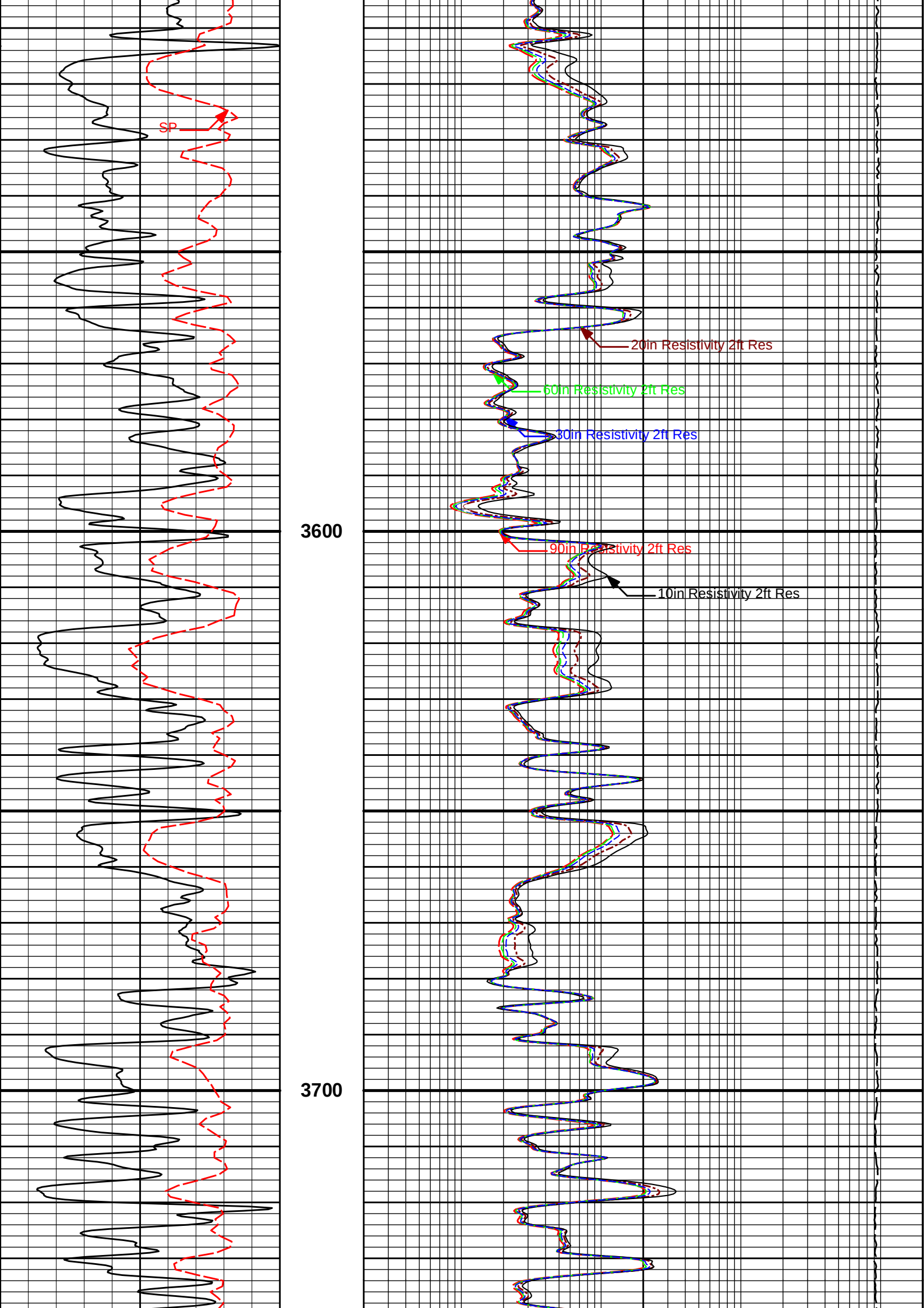

20in Resistivity 2ft Res
60in Resistivity 2ft Res
30in Resistivity 2ft Res
2400
90in Resistivity 2ft Res
10in Resistivity 2ft Res
2500
SP

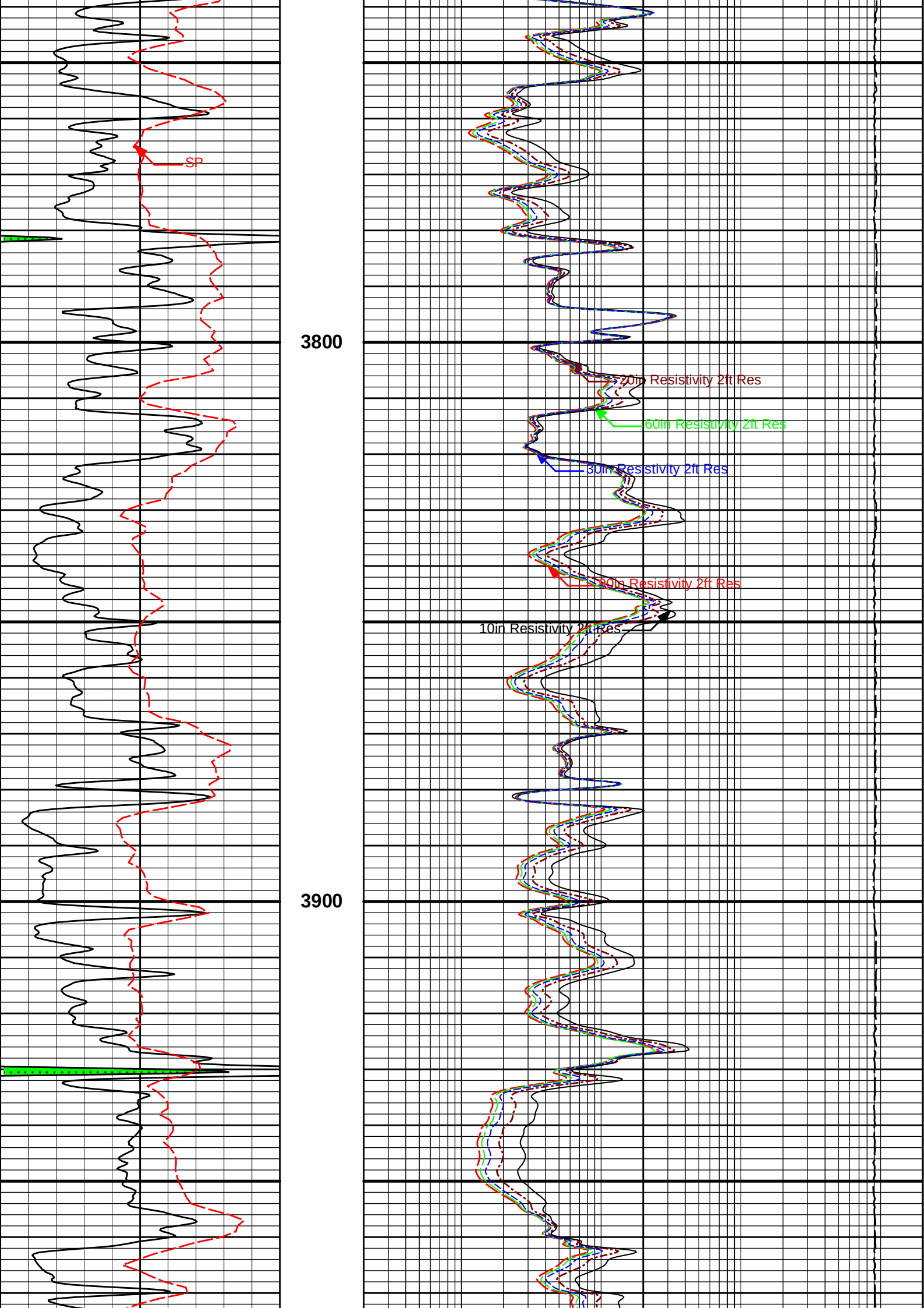

2600
2700
2800
20in Resistivity 2ft Res
60in Resistivity 2ft Res
30in Resistivity 2ft Res
90in Resistivity 2ft Res
10in Resistivity 2ft Res

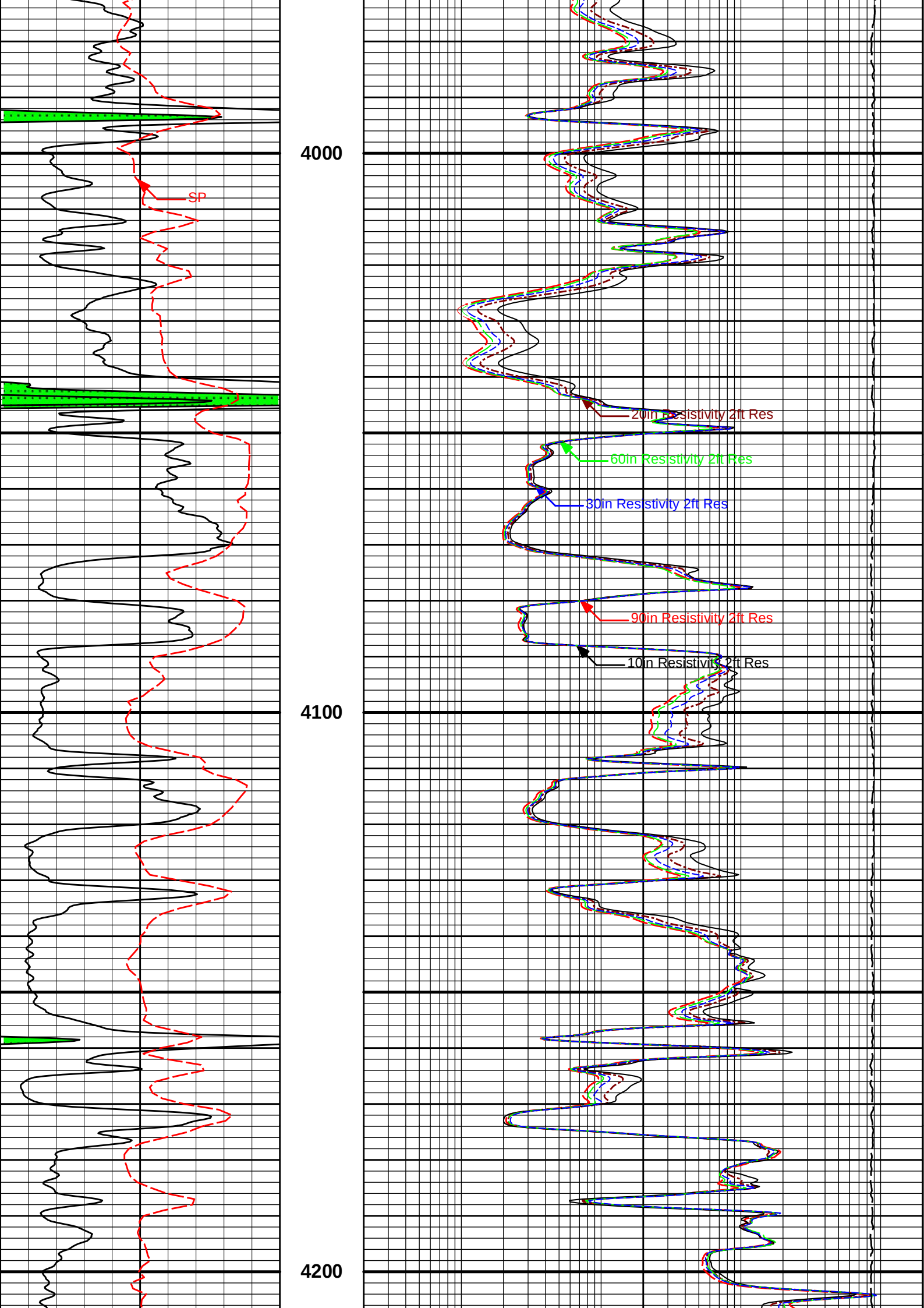

SP
20in Resistivity 2ft Res
60in Resistivity 2ft Res
30in Resistivity 2ft Res
90in Resistivity 2ft Res
20in Resistivity 2ft Res
2900
3000

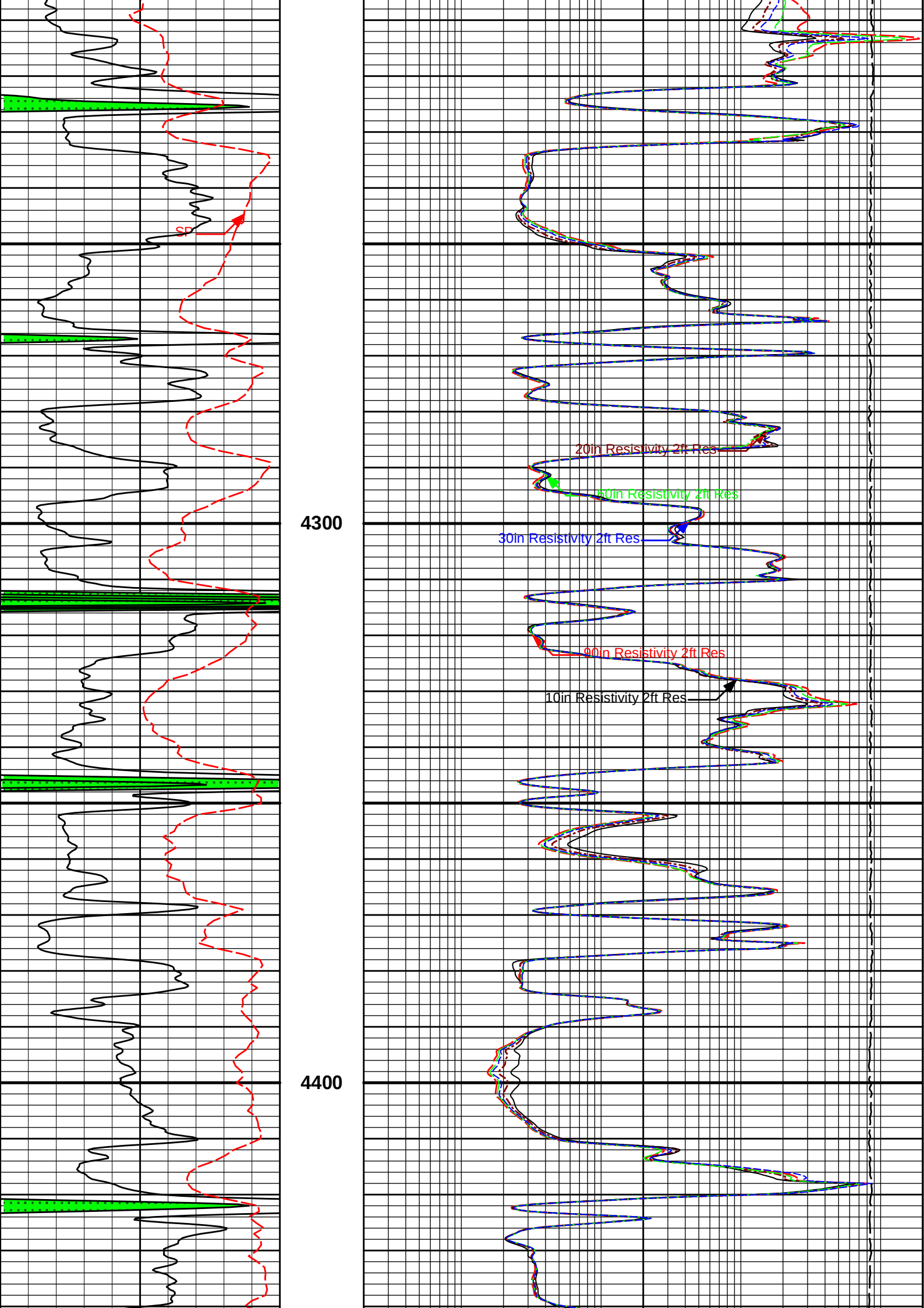

SP
3100
3200
20in Resistivity 2ft Res
60in Resistivity 2ft Res
30in Resistivity 2ft Res
90in Resistivity 2ft Res
10in Resistivity 2ft Res


SP
3300
20in Resistivity 2ft Res
60in Resistivity 2ft Res
30in Resistivity 2ft Res
90in Resistivity 2ft Res
10in Resistivity 2ft Res
3400
3500


SP
20in Resistivity 2ft Res
60in Resistivity 2ft Res
30in Resistivity 2ft Res
3600
90in Resistivity 2ft Res
10in Resistivity 2ft Res
3700


SP
3800
20in Resistivity 2ft Res
60in Resistivity 2ft Res
30in Resistivity 2ft Res
90in Resistivity 2ft Res
10in Resistivity 2ft Res
3900


4000
4100
4200
SP
20in Resistivity 2ft Res
60in Resistivity 2ft Res
30in Resistivity 2ft Res
90in Resistivity 2ft Res
10in Resistivity 2ft Res


SP
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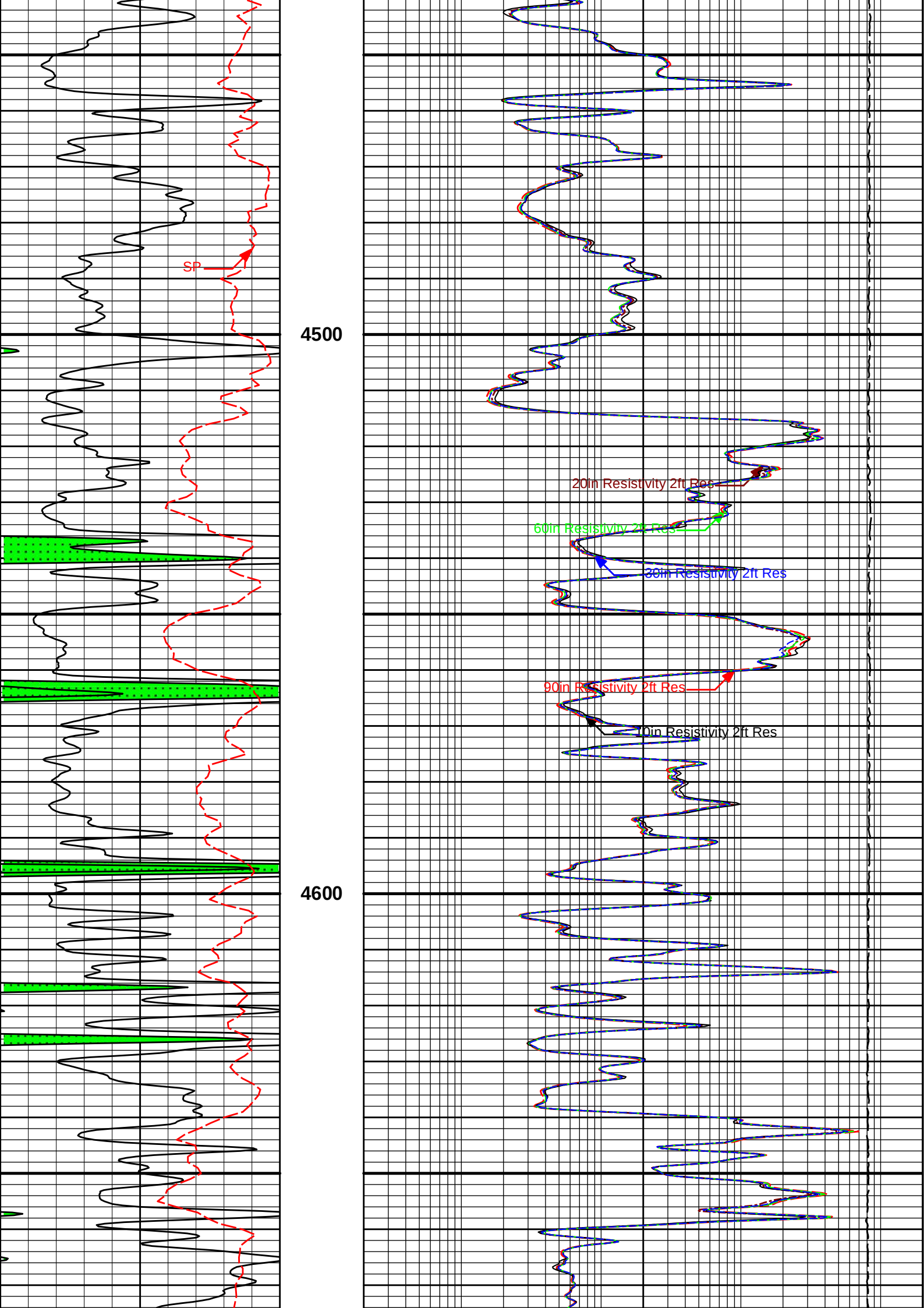
60in Resistivity 2ft Res
4300
30in Resistivity 2ft Res
90in Resistivity 2ft Res
10in Resistivity 2ft Res
4400


SP
4500
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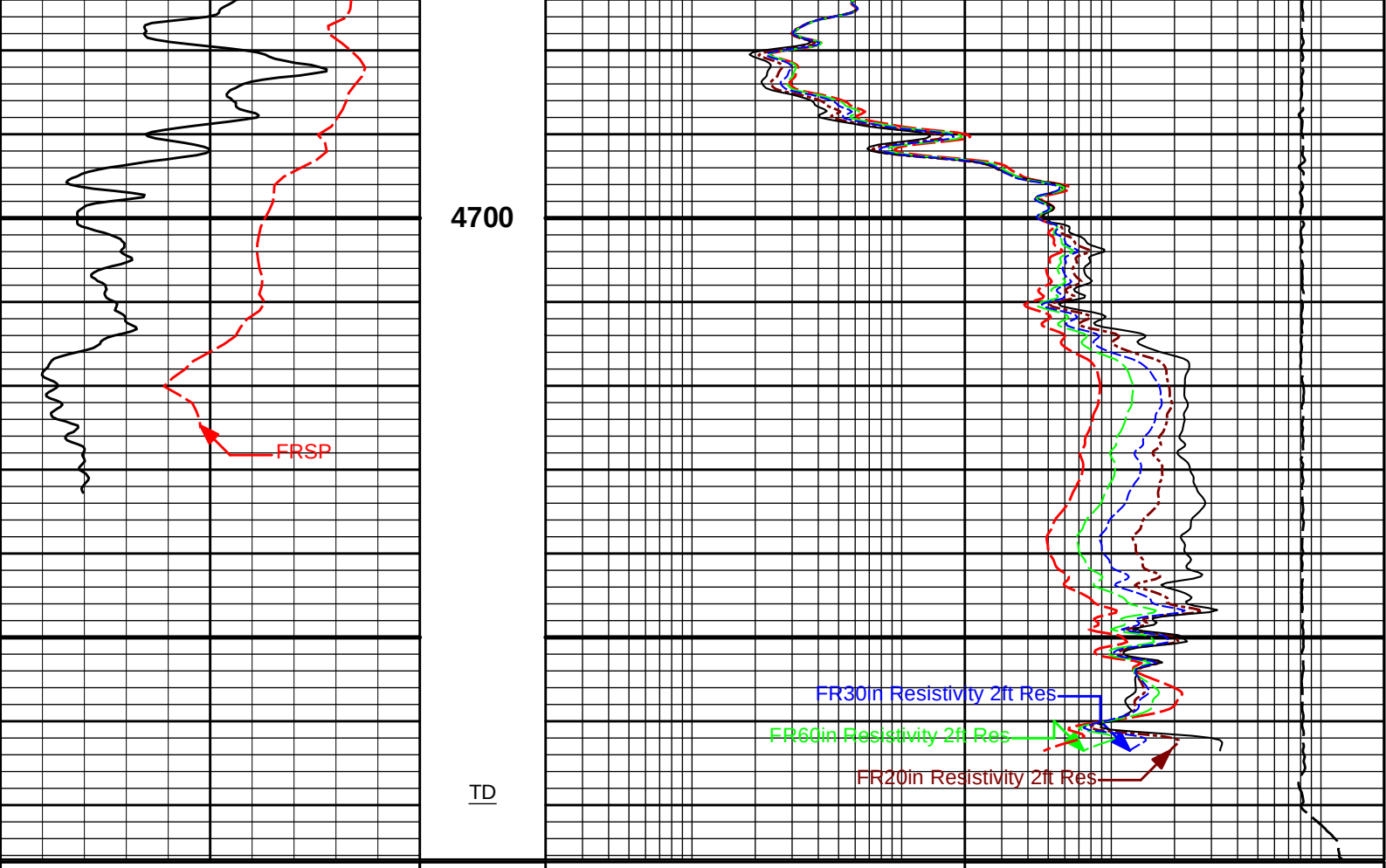
30in Resistivity 2ft Res
90in Resistivity 2ft Res
10in Resistivity 2ft Res
4600



0	Gamma API	150
	api	
	SP	
	-]20[+	

15K	Tension	0
	pounds	
0.2	90in Resistivity 2ft Res	2K
	ohmm	
0.2	60in Resistivity 2ft Res	2000
	ohmm	
0.2	30in Resistivity 2ft Res	2000
	ohm-metre	
0.2	20in Resistivity 2ft Res	2000
	ohmm	
0.2	10in Resistivity 2ft Res	2K
	ohmm	

HALLIBURTON

Plot Time: 05-May-19 04:24:52
Plot Range: 300 ft to 4776.5 ft
Data: RUSSEL_ROHLEDER\Well Based\DAQ-0001-004\
Plot File: \\-LOCAL-\RUSSEL_ROHLEDER\0001 SP_GTET-DSN-SDL-ACRT\ACRT\ACRT_5inch_main

5 INCH MAIN LOG

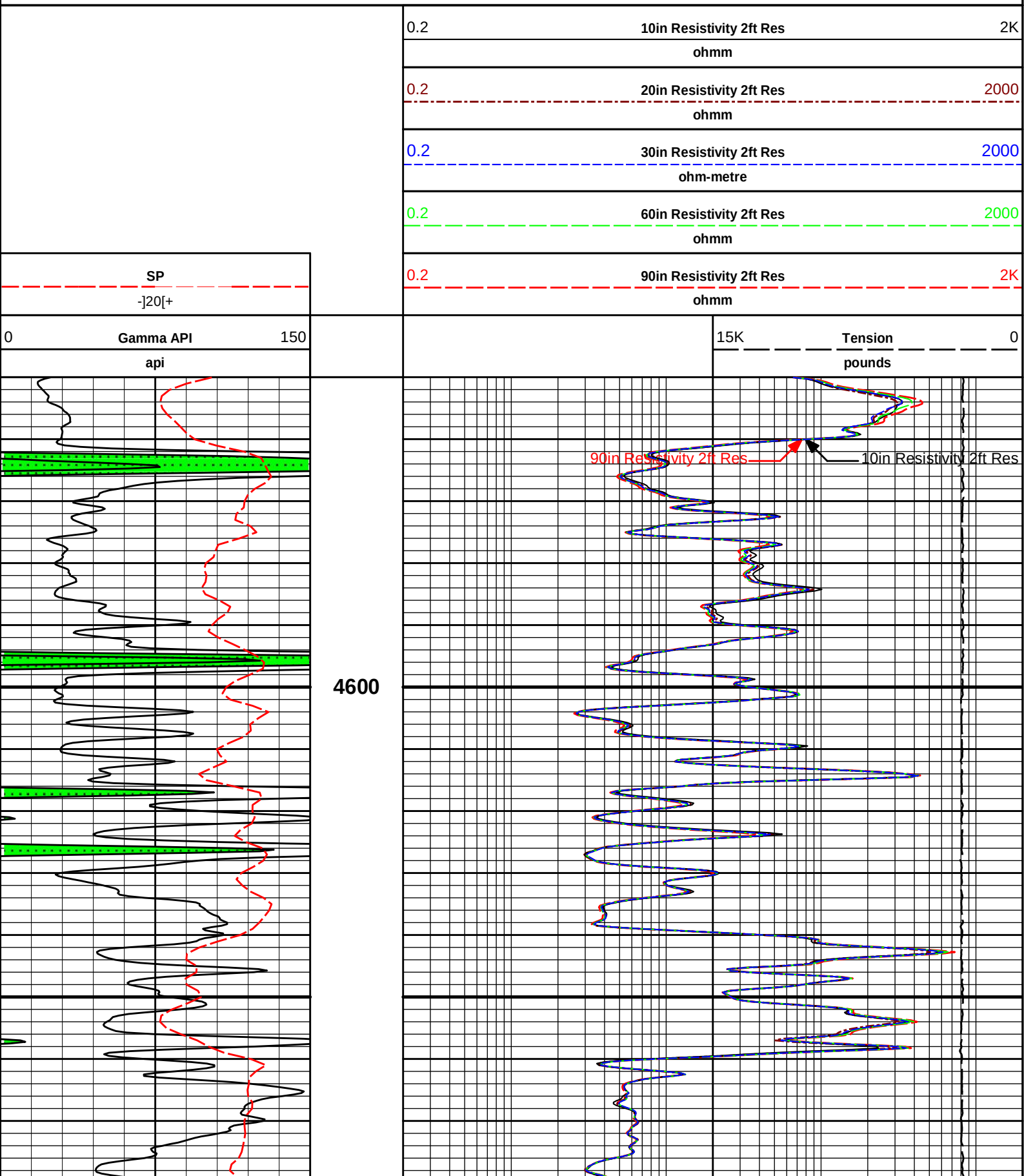
5 INCH MAIN LOG

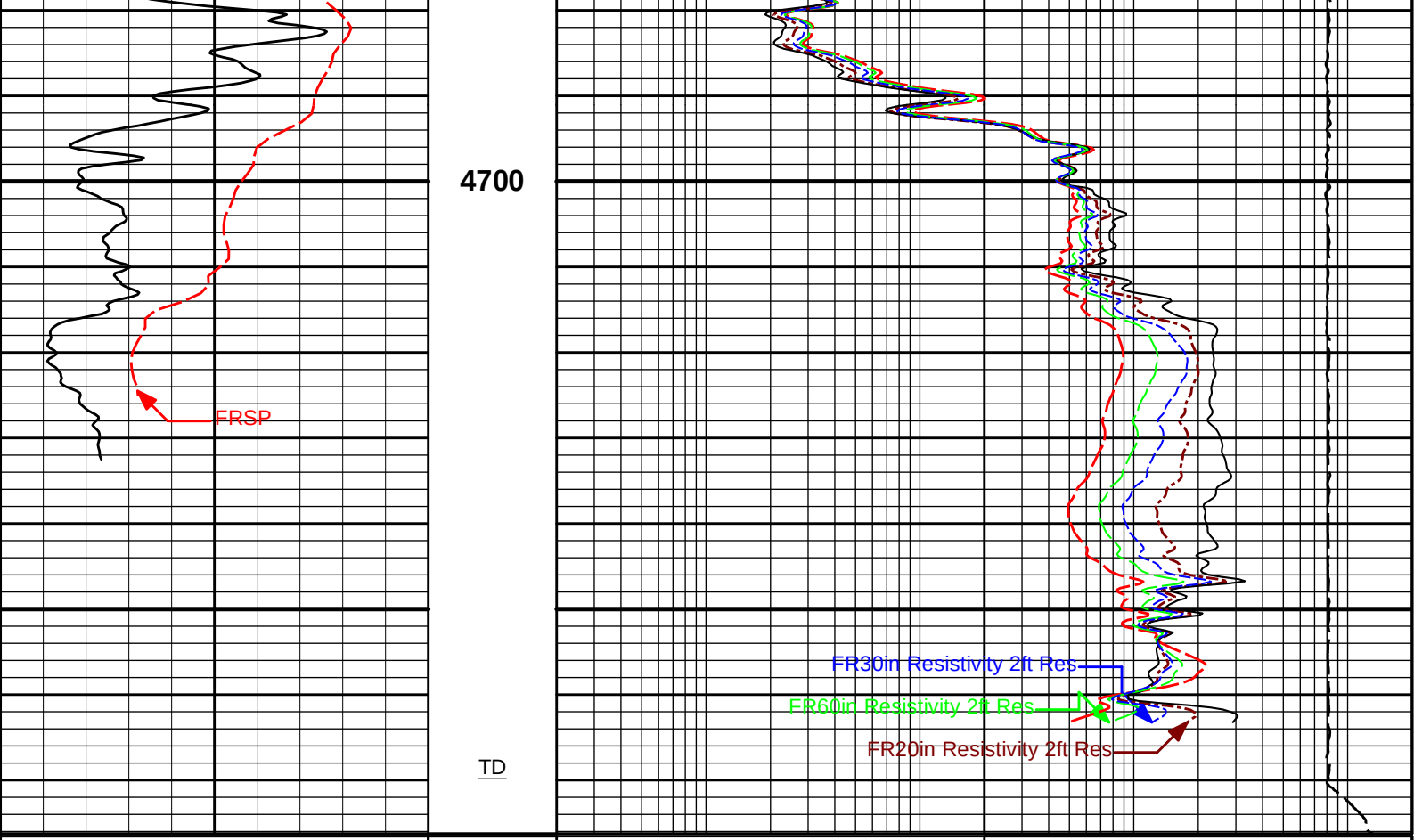
HALLIBURTON

Plot Time: 05-May-19 04:24:52
Plot Range: 4550 ft to 4776.25 ft
Data: RUSSEL_ROHLEDER\Well Based\DAQ-0001-003\
Plot File: \\-LOCAL-\RUSSEL_ROHLEDER\0001 SP_GTET-DSN-SDL-ACRT\ACRT\ACRT_5inch_main

REPEAT SECTION

REPEAT SECTION





0 Gamma API 150		15K Tension 0
api		pounds
SP		0.2 90in Resistivity 2ft Res 2K
-]20[+		ohmm
		0.2 60in Resistivity 2ft Res 2000
		ohmm
		0.2 30in Resistivity 2ft Res 2000
		ohm-metre
		0.2 20in Resistivity 2ft Res 2000
		ohmm
		0.2 10in Resistivity 2ft Res 2K
		ohmm

HALLIBURTON

Plot Time: 05-May-19 04:24:54
Plot Range: 4550 ft to 4776.25 ft
Data: RUSSEL_ROHLEDER\Well Based\DAQ-0001-003\
Plot File: \\-LOCAL-\RUSSEL_ROHLEDER\0001 SP_GTET-DSN-SDL-ACRT\ACRT\ACRT_5inch_main

REPEAT SECTION

REPEAT SECTION

HALLIBURTON

CALIBRATION REPORT

SURFACE TENSION SHOP CALIBRATION

Tool Name:	**Depth Panel - 00000032**	**Reference Calibration Date:**	**16-Mar-16 11:27:47**
Engineer:	**WOLTEMATH**	**Calibration Date:**	**23-Apr-19 21:27:33**
Software Version:	**WL INSITE R6.0.8 (Build 3)**	**Calibration Version:**	**1**

SURFACE TENSION LOAD CELL

Measurement	Load Cell Value	Measurement	Calibrated	Units
Low	10072.80	-778.11	0.00	lbs
High	17464.09	7985.85	7830.00	lbs

DOWNHOLE TENSION SHOP CALIBRATION

Tool Name:	**RWCH - 12345678**	**Reference Calibration Date:**	**02-May-19 23:19:11**
Engineer:	**WHITLOCK**	**Calibration Date:**	**03-May-19 13:30:37**
Software Version:	**WL INSITE R6.0.8 (Build 3)**	**Calibration Version:**	**1**

DOWNHOLE LOAD CELL

Measurement	Tool Value	Measurement	Calibrated	Units
Low	20474.45	6958.47	0.00	lbs
High	22151.95	7513.40	1380.00	lbs

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:	**GTET - 11013113**	**Reference Calibration Date:**	**25-Feb-19 14:17:44**
Engineer:	**WHITLOCK**	**Calibration Date:**	**17-Apr-19 14:54:48**
Software Version:	**WL INSITE R6.0.8 (Build 3)**	**Calibration Version:**	**1**

Calibrator Source S/N: TB-79
Calibrator API Reference:222.00 api
Equivalent Calibrator API Reference:225.9 api

Measurement	Measured	Calibrated	Units
Background	25.4	25.1	api
Background + Calibrator	254.2	251.0	api
Calibrator	228.8	225.9	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:	**GTET - 11013113**	**Reference Calibration Date:**	**17-Apr-19 14:54:48**
Engineer:	**WHITLOCK**	**Calibration Date:**	**26-Apr-19 10:24:46**
Software Version:	**WL INSITE R6.0.8 (Build 3)**	**Calibration Version:**	**1**

Calibrator Source S/N: TB-79
Calibrator API Reference:222.00 api
Equivalent Calibrator API Reference:225.9 api

Field Verification	Shop	Field	Units
Background	25.1	25.2	api
Background + Calibrator	251.0	249.4	api
Calibrator	225.9	224.2	api

Shop	Field	Difference	Tolerance
225.9	224.2	1.7	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	**DSNT - 11055304**	**Reference Calibration Date:**	**19-Apr-19 12:59:35**
Engineer:	**WHITLOCK**	**Calibration Date:**	**19-Apr-19 13:31:18**
Software Version:	**WL INSITE R6.0.8 (Build 3)**	**Calibration Version:**	**1**

Logging Source S/N: DSN-436
Tank Serial Number: EL RENO
Reference value assigned to Tank: 56.100
Snow Block S/N: 12156883
Calibration Tank Water Temperature: 71 degF

Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS

Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	1.04550	1.04715	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):	0.2353	0.2358	0.0005	+/- 0.0020
Calibrated Ratio:	10.5429	10.5596	0.017	+/- 0.050

VERIFIER

Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0694	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 - 11055304**	**Reference Calibration Date:**	**19-Apr-19 13:31:18**
Engineer:	**WHITLOCK**	**Calibration Date:**	**26-Apr-19 10:34:06**
Software Version:	**WL INSITE R6.0.8 (Build 3)**	**Calibration Version:**	**1**

Logging Source S/N: DSN-436

Snow Block S/N: 12156883

NEUTRON FIELD-CHECK SUMMARY

	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0694	0.0707	0.0012	+/- 0.0150

PASS/FAIL SUMMARY

Block Change Check:	Passed
Snow Block Stat Check:	Passed
Temperature Check:	Passed

DENSITY CALIPER SHOP CALIBRATION

Tool Name:	**SDLT - 10960494**	**Reference Calibration Date:**	**01-Jan-70 00:00:00**
Engineer:	**WHITLOCK**	**Calibration Date:**	**19-Apr-19 15:10:24**
Software Version:	**WL INSITE R6.0.8 (Build 3)**	**Calibration Version:**	**1**
Host Tool Name:	**DSNT - 11055304**		

CALIBRATION COEFFICIENTS

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-4116.41	-4116.41	-7000.00 - -1000.00
Pad Gain	0.0003782	0.0003782	0.0002000 - 0.0006000
Arm Offset	-2612.76	-2612.76	-5000.00 - 3000.00
Arm Gain	0.0005131	0.0005131	0.000300 - 0.000700
Arm Power	-0.000004627	-0.000004627	-0.000010000 - 0.000010000

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

Tool Diameter: 4.50 in

CALIBRATION RINGS

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

PAD EXTENSION:				
Small Ring (in)	2.00	2.00	0.00	+/- 0.20
Medium Ring (in)	3.75	3.75	0.00	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.50	6.50	0.00	+/- 0.20
Medium Ring (in)	8.25	8.25	0.00	+/- 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 - 10960494**	**Reference Calibration Date:**	**19-Apr-19 15:10:24**
Engineer:	**WHITLOCK**	**Calibration Date:**	**19-Apr-19 15:12:12**
Software Version:	**WL INSITE R6.0.8 (Build 3)**	**Calibration Version:**	**1**

MEASURED CALIPER VALUES

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.75	0.00	+/- 0.10
Ring Diameter	8.25	8.25	-0.00	+/- 0.15

PASS/FAIL SUMMARY

Pad Extension Check:	Passed
Diameter Check:	Passed

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name:	**ACRt Sonde - 11830728**	**Reference Calibration Date:**	**31-Oct-18 14:22:50**
Engineer:	**WHITLOCK**	**Calibration Date:**	**27-Mar-19 11:06:32**
Software Version:	**WL INSITE R6.0.2 (Build 8)**	**Calibration Version:**	**1**
Host Tool Name:	**ACRt Instrument - 11830684**		

TYPICAL GAIN RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0408	1.05	0.95	1.0181	1.05	0.95	1.0095	1.05
A2 (50")	0.95	1.0367	1.05	0.95	1.0155	1.05	0.95	1.0105	1.05
A3 (29")	0.95	1.0317	1.05	0.95	1.0098	1.05	0.95	1.0024	1.05
A4 (17")	0.95	1.0385	1.05	0.95	1.0148	1.05	0.95	1.0094	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.0181	1.05	0.95	1.0119	1.05
A6 (6")	N/A	N/A	N/A	0.95	1.0267	1.05	0.95	1.0201	1.05

SONDE OFFSET

Subarray	R12KHz	R36KHz	R72KHz
	(mmho/m)	(mmho/m)	(mmho/m)
A1 (80")	-0.236	-5.186	-5.852
A2 (50")	0.946	-3.552	-5.481
A3 (29")	-12.619	-4.085	-3.872
A4 (17")	-94.869	-29.774	-24.286
A5 (10")	N/A	-74.930	-36.896
A6 (6")	N/A	293.687	156.113

TRANSMITTER CURRENT GAIN

Signal	Lower	Measured	Upper

R-MUD VERIFICATION

Signal	Lower	Measured	Upper

Signal	Lower	R	Upper	Signal	(ohm-m)	(ohm-m)	(ohm-m)
12K	0.6	0.84	1.3	Mud Cell	0.95	0.99	1.05
36K	1.0	1.81	2.0				
72K	1.0	1.08	2.0				

PASS/FAIL SUMMARY

GAIN RANGE CHK	PASS
SONDE OFFSET CHK	PASS

TOOL OK TO LOG

QUALITY CHECK SHOP CALIBRATION

Tool Name:	**ACRt Sonde - 11830728**	**Reference Calibration Date:**	**27-Mar-19 11:08:08**
Engineer:	**WHITLOCK**	**Calibration Date:**	**27-Mar-19 11:09:33**
Software Version:	**WL INSITE R6.0.2 (Build 8)**	**Calibration Version:**	**1**
Host Tool Name:	**ACRt Instrument - 11830684**		

STANDARD DEVIATIONS

	R12KHz			R36KHz			R72KHz		
	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail
A1 (80")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A2 (50")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A3 (29")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A4 (17")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A5 (10")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A6 (6")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass

AVERAGES

	R12KHz			R36KHz			R72KHz		
	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail
A1 (80")	0.000	< 0.500	Pass	-0.001	> -0.500	Pass	-0.006	> -0.500	Pass
A2 (50")	0.000	< 0.500	Pass	-0.001	> -0.500	Pass	-0.005	> -0.500	Pass
A3 (29")	-0.000	< 0.500	Pass	-0.001	> -0.500	Pass	-0.003	> -0.500	Pass
A4 (17")	-0.002	> -0.500	Pass	-0.007	> -0.500	Pass	-0.024	> -0.500	Pass
A5 (10")	-0.010	> -0.500	Pass	-0.017	> -0.500	Pass	-0.036	> -0.500	Pass
A6 (6")	0.014	< 0.500	Pass	0.063	< 0.500	Pass	0.138	< 0.500	Pass

GAIN TOLERANCE

R12KHz

	Measured (mmho/m)	Last Month (mmho/m)	Difference (mmho/m)	Tolerance (mmho/m)	Pass/Fail
A1 (80")	-214207680.000	-214179520.000	28160.000	10708976.000	Pass
A2 (50")	-206708368.000	-206673776.000	34592.000	10333688.800	Pass
A3 (29")	-201738432.000	-201708688.000	29744.000	10085434.400	Pass
A4 (17")	-201131136.000	-201103920.000	27216.000	10055196.000	Pass
A5 (10")	-201166688.000	-201139392.000	27296.000	10056969.600	Pass
A6 (6")	-200820928.000	-200790224.000	30704.000	10039511.200	Pass

R36KHz

	Measured (mmho/m)	Last Month (mmho/m)	Difference (mmho/m)	Tolerance (mmho/m)	Pass/Fail
A1 (80")	49716636.000	49685420.000	31216.000	2484271.000	Pass
A2 (50")	35654644.000	35621340.000	33304.000	1781067.000	Pass
A3 (29")	29652460.000	29621220.000	31240.000	1481061.000	Pass
A4 (17")	29377682.000	29345894.000	31788.000	1467294.700	Pass
A5 (10")	28976940.000	28946928.000	30012.000	1447346.400	Pass

A5 (10")	28976940.000	28946928.000	30012.000	1447346.400	Pass
A6 (6")	27667190.000	27635410.000	31780.000	1381770.500	Pass

R72KHz

	Measured (mmho/m)	Last Month (mmho/m)	Difference (mmho/m)	Tolerance (mmho/m)	Pass/Fail
A1 (80")	-93174168.000	-93165432.000	8736.000	4658271.600	Pass
A2 (50")	-90798624.000	-90786864.000	11760.000	4539343.200	Pass
A3 (29")	-88522848.000	-88513168.000	9680.000	4425658.400	Pass
A4 (17")	-88712168.000	-88700376.000	11792.000	4435018.800	Pass
A5 (10")	-87283416.000	-87271512.000	11904.000	4363575.600	Pass
A6 (6")	-88347128.000	-88335576.000	11552.000	4416778.800	Pass

PASS/FAIL SUMMARY

Std Deviation Verification	Pass
Average Verification	Pass
Gain Tolerance Verification	Pass

MICRO LOG SHOP CALIBRATION

Tool Name:	**Microlog Pad - 10960494**	**Reference Calibration Date:**	**09-Jan-16 16:38:49**
Engineer:	**WHITLOCK**	**Calibration Date:**	**19-Apr-19 15:03:30**
Software Version:	**WL INSITE R6.0.8 (Build 3)**	**Calibration Version:**	**1**
Host Tool Name:	**DSNT - 11055304**		

CALIBRATION COEFFICIENT SUMMARY

Measurement	Micro Log Normal		Micro Log Lateral		
	Measured	Calibrated	Measured	Calibrated	Units
Tool Zero	0.00	-0.11	0.00	-0.01	ohmm
Calibration Point #1	0.11	0.00	0.01	0.00	ohmm
Calibration Point #2	20.61	20.00	23.36	20.00	ohmm
Internal Reference	20.50	19.89	23.34	19.98	ohmm

Measurement	Micro Log Normal Tool Value	Micro Log Lateral Tool Value	Units
Tool Zero	-1.03	1.14	V
Calibration Point #1	27.13	4.08	V
Calibration Point #2	5346.13	6899.88	V
Internal Reference	5316.31	6893.17	V

MICRO LOG FIELD CHECK

Tool Name:	**Microlog Pad - 10960494**	**Reference Calibration Date:**	**19-Apr-19 15:03:30**
Engineer:	**WHITLOCK**	**Calibration Date:**	**29-Apr-19 09:51:09**
Software Version:	**WL INSITE R6.0.8 (Build 3)**	**Calibration Version:**	**1**

Measurement	Micro Log Normal		Micro Log Lateral		
	Shop	Field	Shop	Field	Units
Tool Zero	-0.11	-0.10	-0.01	-0.01	ohmm
Internal Reference	19.89	19.91	19.98	20.00	ohmm

Summary

Signal	Shop	Field	Difference	Tolerence
Microlog Normal	19.89	19.91	-0.02	+/- 0.80
Microlog Lateral	19.98	20.00	-0.02	+/- 0.80

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name:	**SDLT Pad - 11213308**	**Reference Calibration Date:**	**14-Dec-18 11:15:00**
Engineer:	**WHITLOCK**	**Calibration Date:**	**20-Feb-19 12:17:03**
Software Version:	**WL INSITE R5.8.9 (Build 6)**	**Calibration Version:**	**1**

Logging Source S/N: 5475GW

Aluminum Block S/N: El Reno Aluminum Block — Density: 2.581g/cc — Pe: 3.170

Magnesium Block S/N: El Reno Magnesium Block — Density: 1.687g/cc — Pe: 2.594

DENSITY CALIBRATION SUMMARY

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	0.9935	0.9902	0.90 - 1.10
Near Dens Gain	0.9891	0.9881	0.90 - 1.10
Near Peak Gain	1.0020	1.0148	0.90 - 1.10
Near Lith Gain	1.0071	1.0175	0.90 - 1.10
Far Bar Gain	1.0015	1.0048	0.90 - 1.10
Far Dens Gain	0.9919	0.9938	0.90 - 1.10
Far Peak Gain	0.9878	0.9921	0.90 - 1.10
Far Lith Gain	0.9743	0.9808	0.90 - 1.10
Near Bar Offset	0.1918	0.2246	NONE
Near Dens Offset	0.2308	0.2401	NONE
Near Peak Offset	0.0959	-0.0122	NONE
Near Lith Offset	0.0296	-0.0574	NONE
Far Bar Offset	0.0411	0.0135	NONE
Far Dens Offset	0.1442	0.1314	NONE
Far Peak Offset	0.1660	0.1305	NONE
Far Lith Offset	0.2364	0.1860	NONE
Near Bar Background	937.48	939.15	700 - 1450
Near Dens Background	311.57	312.43	230 - 480
Near Peak Background	135.23	136.70	100 - 210
Near Lith Background	166.58	166.31	125 - 260
Far Bar Background	479.15	478.16	450 - 900
Far Dens Background	191.75	190.12	175 - 345
Far Peak Background	77.50	76.92	70 - 140
Far Lith Background	79.00	78.81	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.689	1.687	-0.002	+/- 0.015
Pe	2.556	2.551	-0.005	+/- 0.150
ALUMINUM				
Density (g/cc)	2.580	2.581	0.001	+/- 0.01500
Pe	3.107	3.123	0.016	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0000	+/- 0.0110	-0.0004	+/- 0.0140
Magnesium Block	-0.0005	+/- 0.0110	-0.0010	+/- 0.0140
Aluminum Block	-0.0013	+/- 0.0110	0.0004	+/- 0.0140
Resolution	9.27	6.00 - 11.50	9.45	6.00 - 11.50
Internal Verifier(B+D+P+L)	1555	1200 - 2700	824	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 - 11213308**	**Reference Calibration Date:**	**20-Feb-19 12:17:03**
Engineer:	**WHITLOCK**	**Calibration Date:**	**29-Apr-19 09:53:55**
Software Version:	**WL INSITE R6.0.8 (Build 3)**	**Calibration Version:**	**1**

Pad Temperature: 78.8 degF

DENSITY FIELD CALIBRATION SUMMARY

Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1554.595	1544.138	-10.457	15.869
Far (B+D+P+L) cps	824.007	811.331	-12.676	15.826
Near Resolution	9.27	9.15	-0.120	0.50
Far Resolution	9.45	9.35	-0.100	1.00

PASS/FAIL SUMMARY

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

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
Depth Panel-00000032						
Tension Zero	0.00	----------	----------	0.00	----------	lbs
Tension Cal	7830.00	----------	----------	0.00	----------	lbs
RWCH-12345678						
DH Tension Zero	0.00	----------	----------	0.00	----------	lbs
DH Tension Cal	1380.00	----------	----------	0.00	----------	lbs
GTET-11013113						
Gamma Ray Calibrator	225.9	224.2	----------	1.7	+/- 9.00	api
DSNT-11055304						
Snow-Block Porosity	0.0694	0.0707	----------	-0.0013	+/- 0.0150	decp
SDLT-10960494						
Pad Extension	3.75	3.75	----------	0.00	+/-0.10	in
Ring Diameter	8.25	8.25	----------	0.00	+/-0.15	in
ACRt Sonde-11830728						
Mud Cell	0.99	----------	----------	0	----------	ohm-m
Microlog Pad-10960494						
MicroLog Normal	19.89	19.91	----------	-0.02	+/-0.80	ohmm
MicroLog Lateral	19.98	20.00	----------	-0.02	+/-0.80	ohmm
SDLT Pad-11213308						
Near(B+D+P+L)	1554.595	1544.138	----------	10.457	+/-15.869	cps
Far(B+D+P+L)	824.007	811.331	----------	12.676	+/-15.826	cps

Data: RUSSEL_ROHLEDER\0001 SP_GTET-DSN-SDL-ACRT\IDLE **Date: 05-May-19 01:06:18**

HALLIBURTON

PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units

TOP

SHARED	BS	Bit Size	7.875	in
SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
SHARED	MDBS	Mud Base	Water	
SHARED	MDWT	Borehole Fluid Weight	9.200	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	5.500	in
SHARED	CSTR	Compressive Strength	1000.00	psia
SHARED	ST	Surface Temperature	75.0	degF
SHARED	TD	Total Well Depth	4770.00	ft
SHARED	BHT	Bottom Hole Temperature	120.0	degF
SHARED	SVTM	Navigation and Survey Master Tool	NONE	
SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
SHARED	TEMM	CBM Temperature Master Tool	GTET	
SHARED	SOCI	Source of Casing Information	Parameters	
SHARED	MSAL	Water-base mud filtrate salinity	0.00	ppm
Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
Rwa / CrossPlot	AFAC	Archie A factor	0.6200	
Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
Rwa / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
Rwa / CrossPlot	BHSM	Borehole Size Source Tool	SDLT	
Rwa / CrossPlot	ROIN	Input for RO Calculation	Rwa	
GTET	GROK	Process Gamma Ray?	Yes	
GTET	GEOK	Process Gamma Ray EVR?	No	
GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
GTET	BHSM	Borehole Size Source Tool	SDLT	
DSNT	DNOK	Process DSN?	Yes	
DSNT	DEOK	Process DSN EVR?	No	
DSNT	NLIT	Neutron Lithology	Limestone	
DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
DSNT	DNTT	Temperature Correction Type	None	
DSNT	DPRS	DSN Pressure Correction Type	None	
DSNT	SHCO	View More Correction Options	No	
DSNT	UTVD	Use TVD for Gradient Corrections?	No	
DSNT	LHWT	Logging Horizontal Water Tank?	No	
DSNT	UCLA	Classic Neutron Parameter utilized?	No	
DSNT	BHSM	Borehole Size Source Tool	SDLT	
SDLT	CLOK	Process Caliper Outputs?	Yes	
Microlog Pad	MLOK	Process MicroLog 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	DTWN	Disable temperature warning	No	
SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
SDLT Pad	BHSM	Borehole Size Source Tool	SDLT	
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Upr	
ACRt Sonde	TPOS	Tool Position	Free Hanging	
ACRt Sonde	RMOP	Rmud Source	Mud Cell	
ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt Sonde	RMAX	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm
ACRt Sonde	BHSM	Borehole Size Source Tool	SDLT	
ACRt Sonde	MBFL	Apply Corkscrew Effect?	No	

BOTTOM

Data: RUSSEL_ROHLEDER\0001 SP_GTET-DSN-SDL-ACRT\IDLE **Date: 05-May-19 01:07:11**

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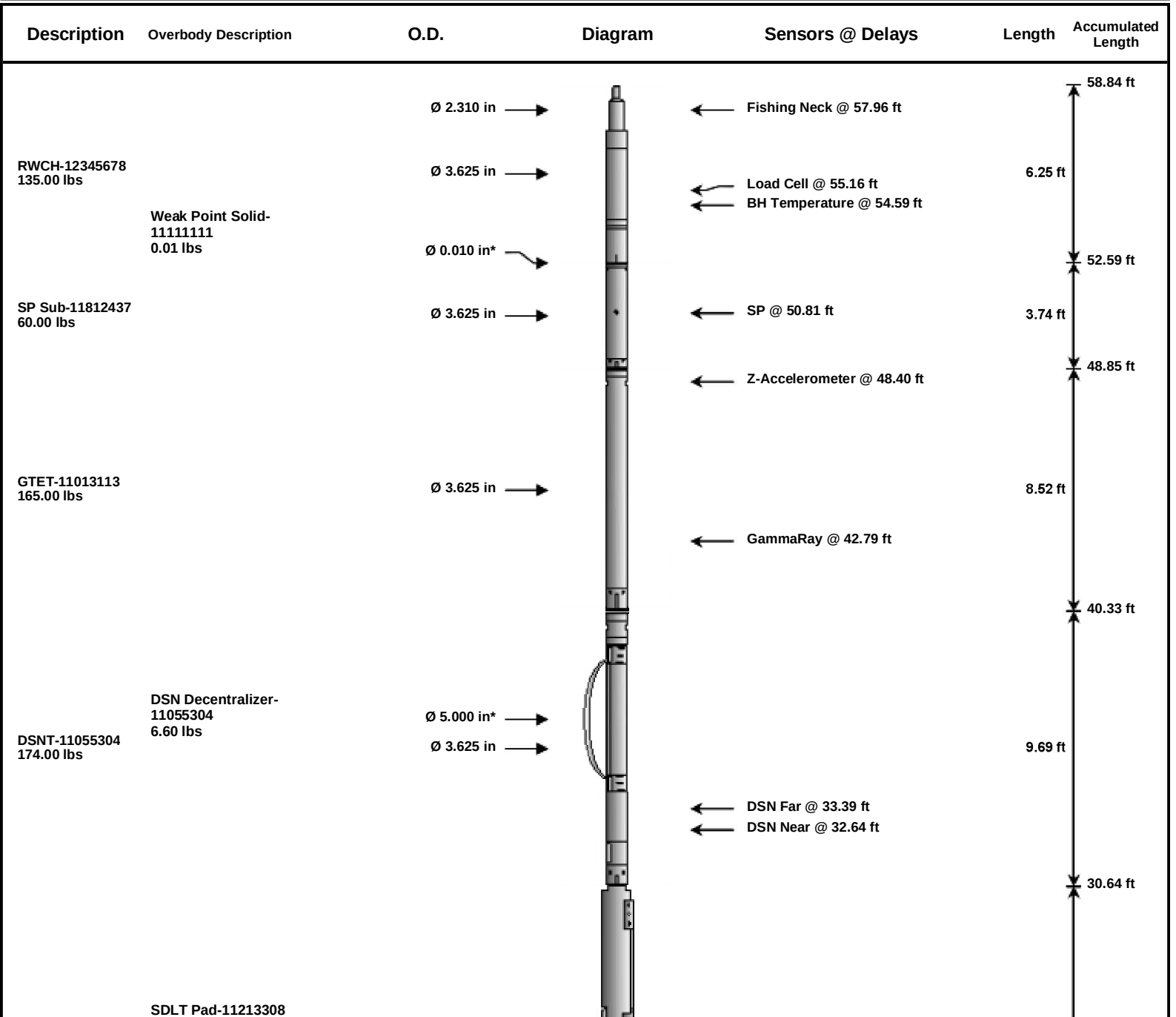
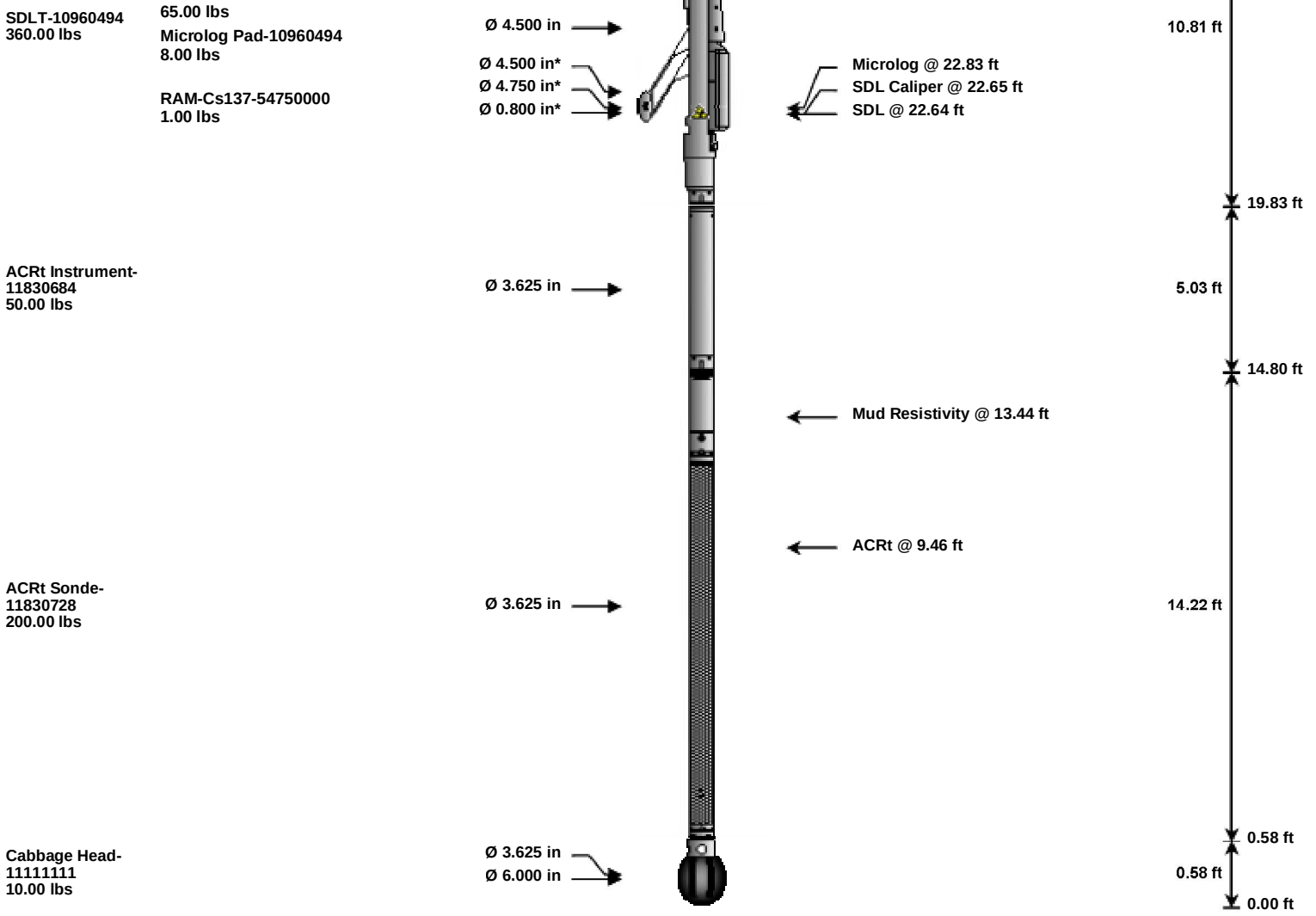
TOOL STRING DIAGRAM REPORT





Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)		Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head	12345678	135.00	6.25		52.59	300.00
WPSS	Weak Point Solid	11111111	0.01	0.01	*	52.59	300.00
SP	SP Sub	11812437	60.00	3.74		48.85	300.00
GTET	Gamma Telemetry Tool	11013113	165.00	8.52		40.33	60.00
DSNT	Dual Spaced Neutron	11055304	174.00	9.69		30.64	60.00
DCNT	DSN Decentralizer	11055304	6.60	5.13	*	33.97	300.00
SDLT	Spectral Density Tool	10960494	360.00	10.81		19.83	60.00
SDLP	Density Insite Pad	11213308	65.00	2.55	*	22.04	60.00
Cs137	Logging Source, SDLT-I, 1.78 Ci - Cs137	54750000	1.00	0.80	*	22.27	300.00
MICP	Microlog Pad	10960494	8.00	1.00	*	22.33	60.00
ACRt	Array Compensated True Resistivity Instrument Section	11830684	50.00	5.03		14.80	120.00
ACRt	Array Compensated True Resistivity Sonde Section	11830728	200.00	14.22		0.58	120.00
CBHD	Cabbage Head	11111111	10.00	0.58		0.00	300.00
Total			**1,234.61**	**58.84**			

* Not included in Total Length and Length Accumulation.

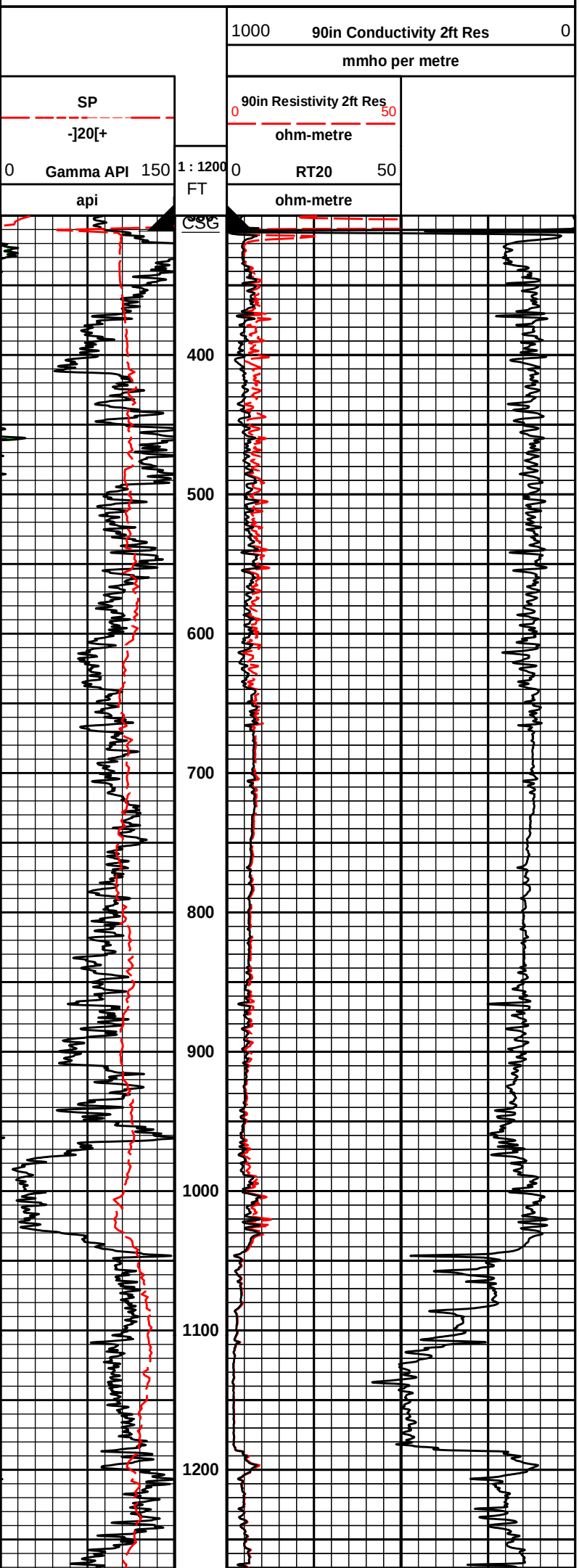
Data: RUSSEL_ROHLEDER\0001 SP_GTET-DSN-SDL-ACRT\IDLE **Date: 05-May-19 01:07:28**

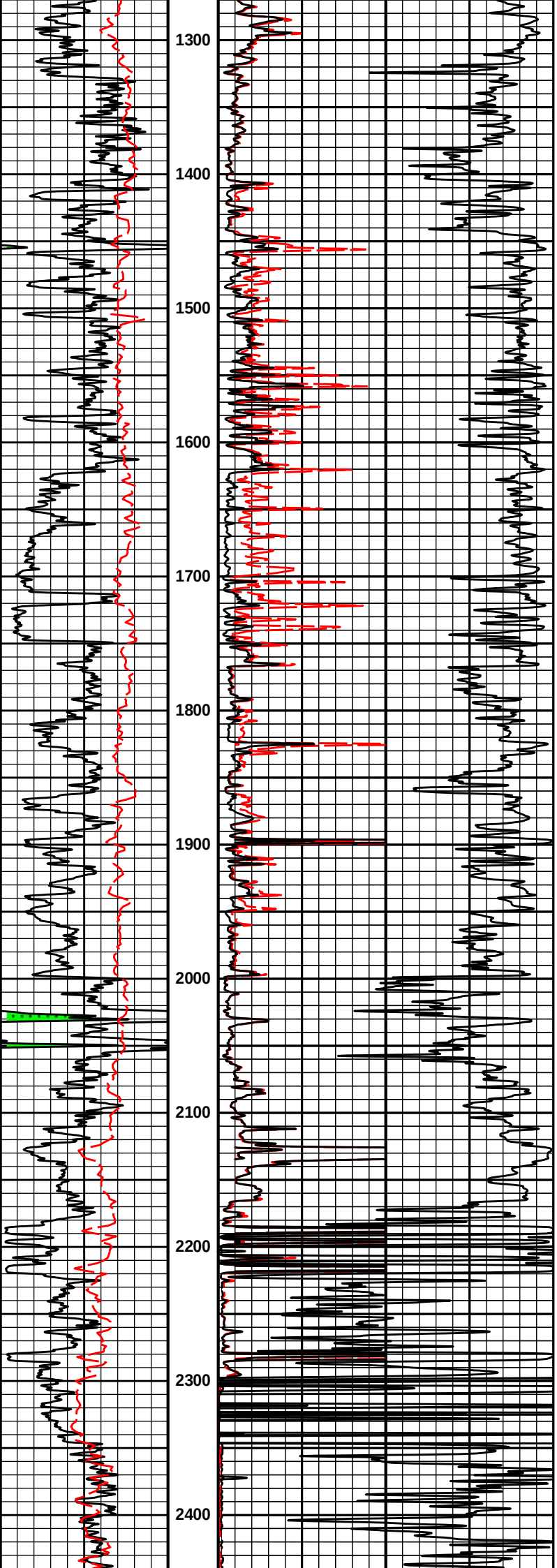
HALLIBURTON

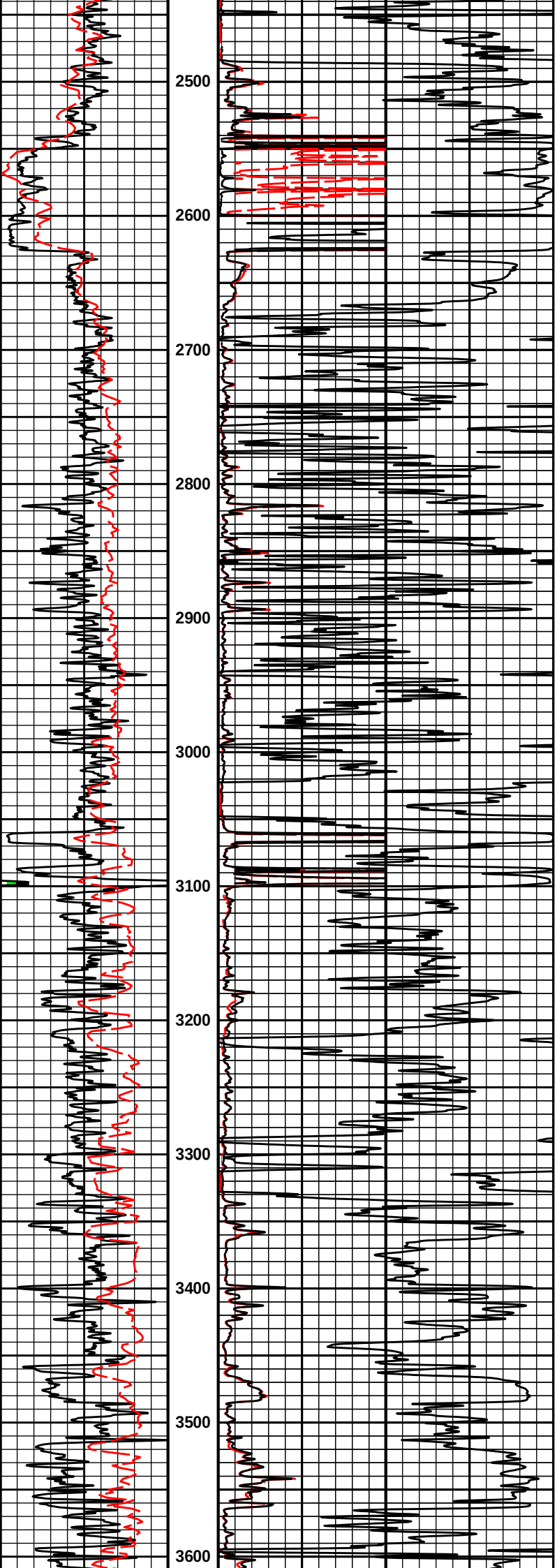
Plot Time: 05-May-19 04:25:13
Plot Range: 300 ft to 4776 ft
Data: RUSSEL_ROHLEDER\Well Based\DAQ-0001-004
Plot File: \\-LOCAL-\RUSSEL_ROHLEDER\0001 SP_GTET-DSN-SDL-ACRT\ACRT\ACRT_1_main

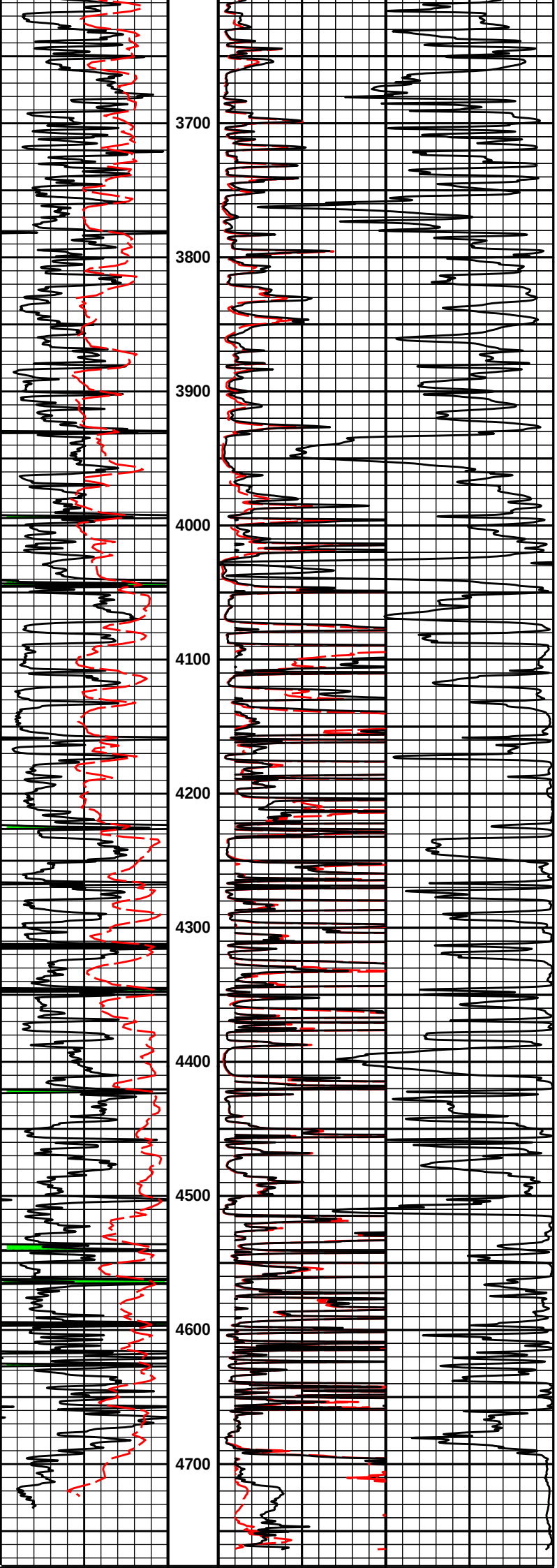
1 INCH MAIN LOG

1 INCH CORRELATION LOG


1000
90in Conductivity 2ft Res
0
mmho per metre
SP
-]20[+
90in Resistivity 2ft Res
0
50
ohm-metre
0
Gamma API
150
1 : 1200
FT
0
RT20
50
api
ohm-metre
CSG
400
500
600
700
800
900
1000
1100
1200


1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400


2500
2600
2700
2800
2900
3000
3100
3200
3300
3400
3500
3600


3700
3800
3900
4000
4100
4200
4300
4400
4500
4600
4700

0 Gamma API 150	1 : 1200 FT	0 RT20 50	
api		ohm-metre	
SP		0 90in Resistivity 2ft Res 50	
-]20[+		ohm-metre	
		1000 90in Conductivity 2ft Res 0	
		mmho per metre	

HALLIBURTON

Plot Time: 05-May-19 04:25:15
Plot Range: 300 ft to 4776 ft
Data: RUSSEL_ROHLEDER\Well Based\DAQ-0001-004
Plot File: \\-LOCAL-\RUSSEL_ROHLEDER\0001 SP_GTET-DSN-SDL-ACRT\ACRT\ACRT_1_main

1 INCH MAIN LOG

1 INCH CORRELATION LOG