

HALLIBURTON

ARRAY COMPENSATED
TRUE RESISTIVITY
SPECTRAL DENSITY
DUAL SPACED NEUTRON

COMPANY		NOBLE ENERGY INC	
WELL		RH FARMS I133-12D	
FIELD		WATTENBERG	
COUNTY		WELD	
STATE		CO	
COMPANY		NOBLE ENERGY INC	
WELL		RH FARMS I133-12D	
FIELD		WATTENBERG	
COUNTY		WELD	
STATE		CO	
Permanent Datum		GL	Elev. 4865.0 ft
Log measured from		KB	14.0 ft above perm. Datum
Drilling measured from		KB	
Date		03-Jan-12	
Run No.		ONE	
Depth - Driller		7690.00 ft	
Depth - Logger		7689.0 ft	
Bottom - Logged Interval		7685 ft	
Top - Logged Interval		3848 ft	
Casing - Driller		8.625 in @ 1031.0 ft	@
Casing - Logger		1034.0 ft	
Bit Size		7.875 in	@
Type Fluid in Hole		WATER BASED MUD	
Density		9.2 ppq	40.00 s/qt
PH		8.00 pH	8.0 cp/m
Source of Sample		MUD CELL	
Rm @ Meas. Temperature		1.360 ohmm @ 59.40 degF	@
Rmf @ Meas. Temperature		0.94 ohmm @ 75.00 degF	@
Rmc @ Meas. Temperature		0.988 ohmm @ 75.00 degF	@
Source Rmf		CHART	CHART
Rm @ BHT		0.42 ohmm @ 207.0 degF	@
Time Since Circulation		6.0 hr	
Time on Bottom		03-Jan-12 01:19	
Max. Rec. Temperature		207.0 degF @ 7689.0 ft	@
Equipment		11454566	BRIGHTON
Recorded By		R. TWEETEN	
Witnessed By		M. MCCLELLAND	

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Service Ticket No.: 9180243						API Serial No.: 05123345750000						PGM Version: WL INSITE R3.4.2 (Build 2)																	
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE												RESISTIVITY SCALE CHANGES																	
Date		Sample No.										Type Log		Depth		Scale Up Hole				Scale Down Hole									
Depth-Driller																													
Type Fluid in Hole																													
Density		Viscosity																											
Ph		Fluid Loss																											
Source of Sample												RESISTIVITY EQUIPMENT DATA																	
Rm @ Meas. Temp				@				@				Run No.		Tool Type & No.				Pad Type				Tool Pos.				Other			
Rmf @ Meas. Temp.				@				@				ONE		ACRt				N/A				1.5" S.O.				N/A			
Rmc @ Meas. Temp.				@				@						E6758-S4352															
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.		11277436				Serial No.						Serial No.		M335_P470				Serial No.		11812167									
Model No.		GTET				Model No.						Model No.		SDLT				Model No.		DSNT									
Diameter		3.625"				No. of Cent.						Diameter		4.5"				Diameter		3.625"									
Detector Model No.		GTET				Spacing						Log Type		GAM-GAM				Log Type		NEU-NEU									
Type		SCINT										Source Type		CS-137				Source Type		AM241BE									
Length		8"				LSA [Y/N]						Serial No.		2770GW				Serial No.		DSN434									
Distance to Source		17'				FWDA [Y/N]						Strength		1.5 CI				Strength		15 CI									

LOGGING DATA

GENERAL			GAMMA			ACOUSTIC			DENSITY			NEUTRON		
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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	TD	7554	REC	0	250				20	0	2.68	20	0	SAND
ONE	7554	7235	REC	0	250				20	0	2.71	20	0	LIME
ONE	7235	CSG	REC	0	250				20	0	2.68	20	0	SAND
DIRECTIONAL INFORMATION														
Maximum Deviation			26.00 deg		@	2954.00 ft			KOP			@		
Remarks: RWCH-GTET-CSNG-DSNT-SDLT-ACRt RUN IN COMBINATION.														
ANNULAR HOLE VOLUME CALCULATED USING 4.5-INCH PRODUCTION CASING.														
TENSION PULLS, WASHOUTS AND BOREHOLE RUGOSITY AFFECT LOG RESPONSE.														
CHLORIDES REPORTED AT 600 ppm.														
NO REPEAT SECTION RUN AT CLIENT'S REQUEST.														
YOUR CREW TODAY - R. PERSHALL, S. KEENER, I. KHALID, T. SCHROCK RIG: SAXON 143														
THANK YOU FOR USING HALLIBURTON LOGGING SERVICES - BRIGHTON, CO - (303) 825-4346														
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														



PARAMETERS REPORT

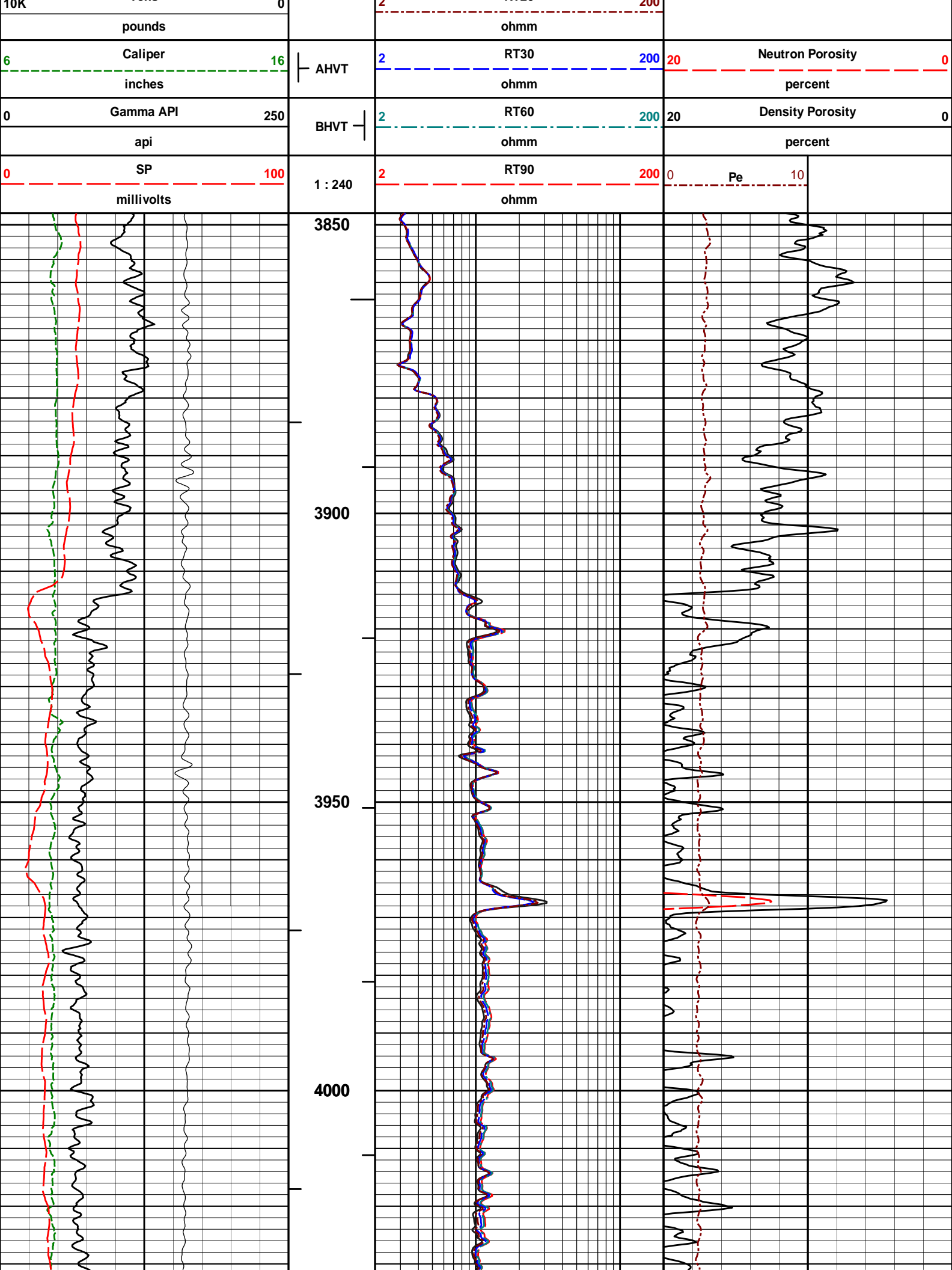
Depth ((ft))	Tool Name	Mnemonic	Description	Value	Units
TOP					
	DSNT	NLIT	Neutron Lithology	Sandstone	
	SDLT Pad	DMA	Formation Density Matrix	2.680	g/cc
7235.00					
	DSNT	NLIT	Neutron Lithology	Limestone	
	SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
7554.00					
	SHARED	BS	Bit Size	7.875	in
	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	Natural	
	SHARED	BSAL	Borehole salinity	600.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	1.360	ohmm
	SHARED	TRM	Temperature of Mud	59.4	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	4.500	in
	SHARED	ST	Surface Temperature	35.0	degF
	SHARED	TD	Total Well Depth	7689.00	ft
	SHARED	BHT	Bottom Hole Temperature	207.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	

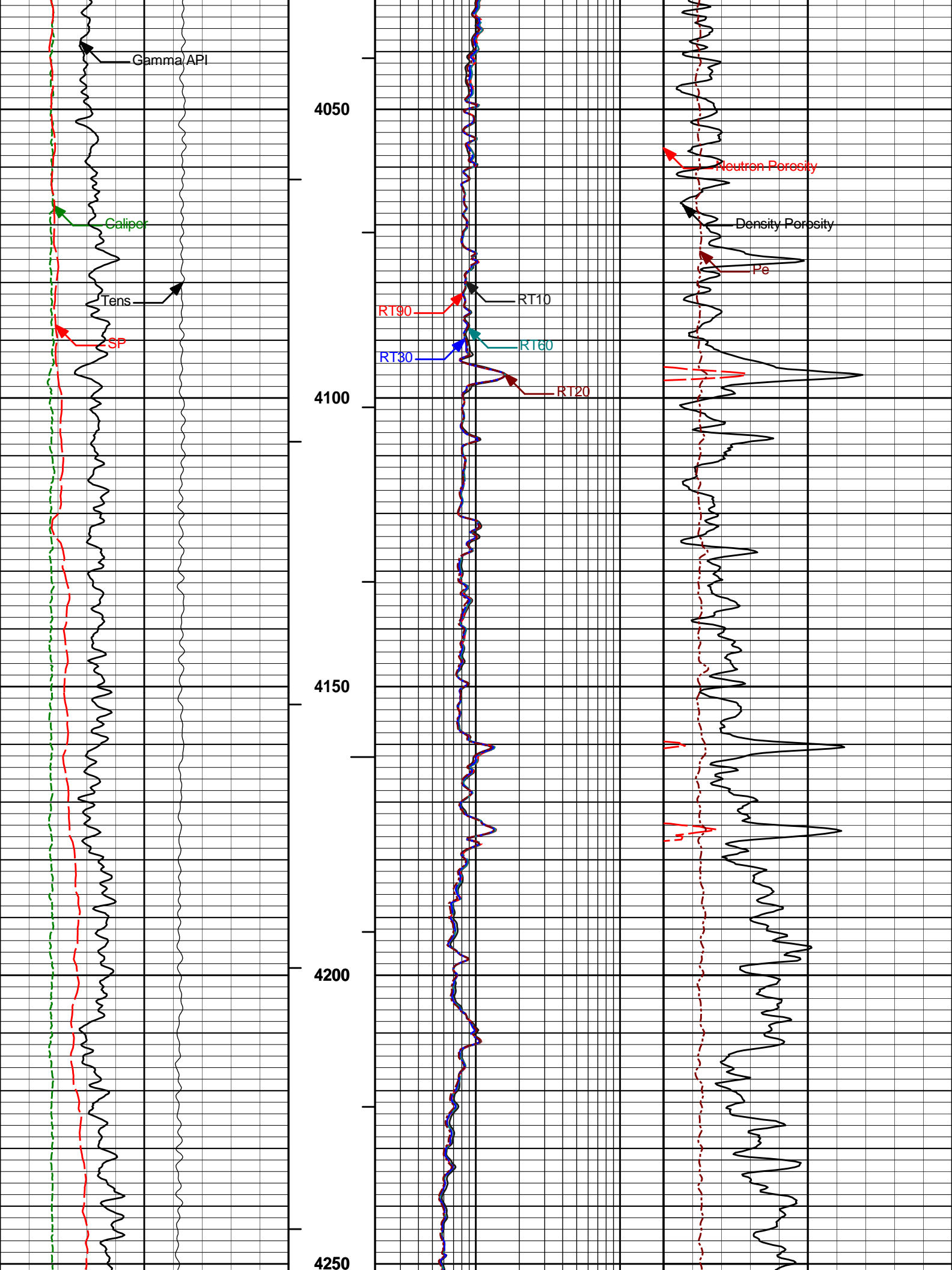
SHARED	TEMM	Temperature Master Tool	NONE	
SHARED	BHSM	Borehole Size Master Tool	NONE	
GTET	GROK	Process Gamma Ray?	Yes	
GTET	GRSO	Gamma Tool Standoff	0.000	in
GTET	GEOK	Process Gamma Ray EVR?	No	
GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
CSNG	CGOK	Process CSNG Data?	Yes	
CSNG	CENT	Is Tool Centralized?	No	
CSNG	GBOK	Gamma Enviromental Corrections?	Yes	
CSNG	BARF	Barite Correction Factor	1.00	
CSNG	ORDG	Use Fixed Gain	No	
CSNG	ORDO	Use Fixed Offset	No	
CSNG	ORDR	Use Fixed Resolution Degradation Factor	No	
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	0.000	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
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	Eccentered	
ACRt Sonde	RMOP	Rmud Source	Mud Cell	
ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt Sonde	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
BOTTOM				
Data: RH_FAR_I133-12D\0001 NOBLE\003.01 03-Jan-12 02:21 Up			Date: 03-Jan-12 02:24:10	

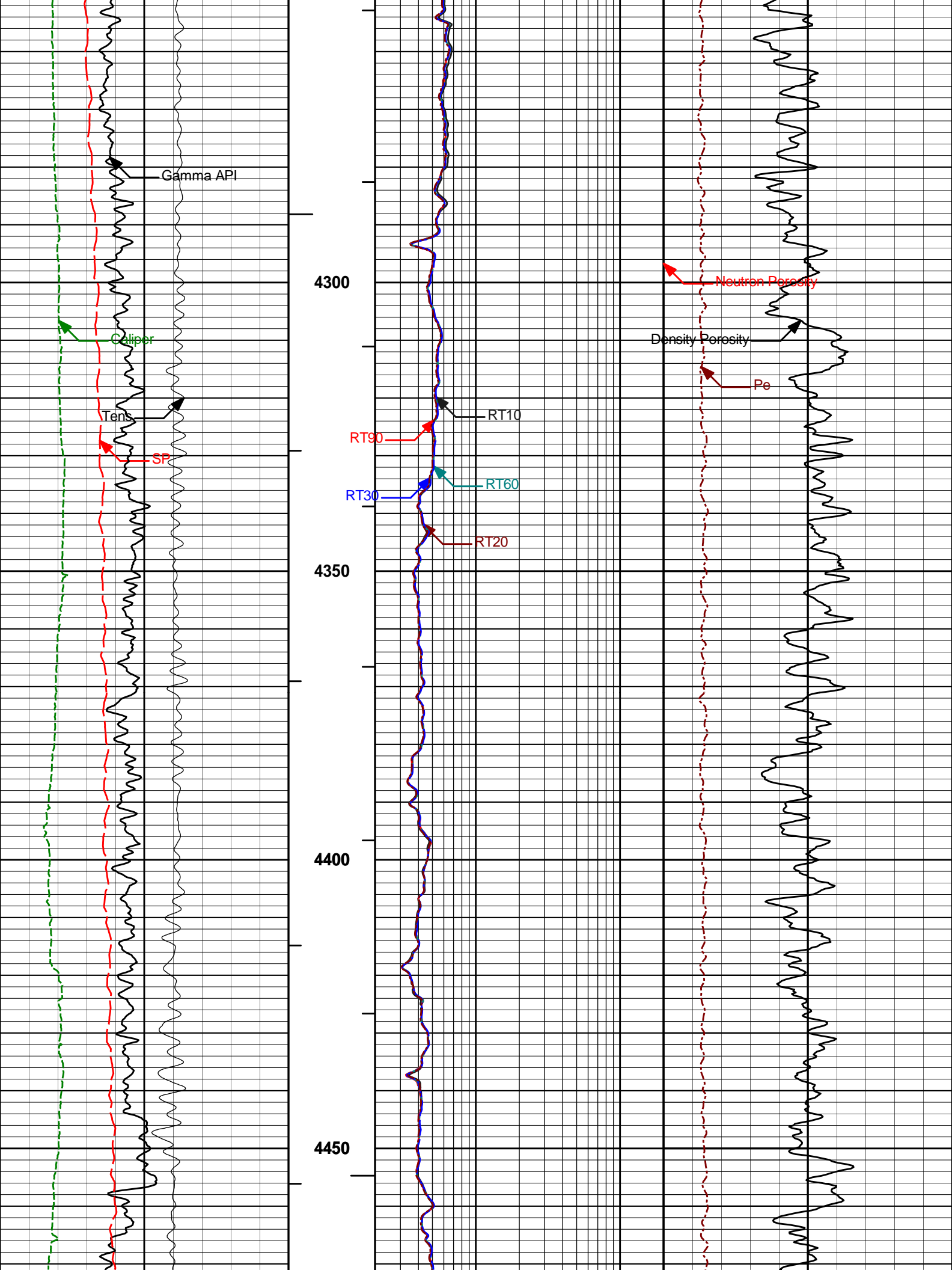
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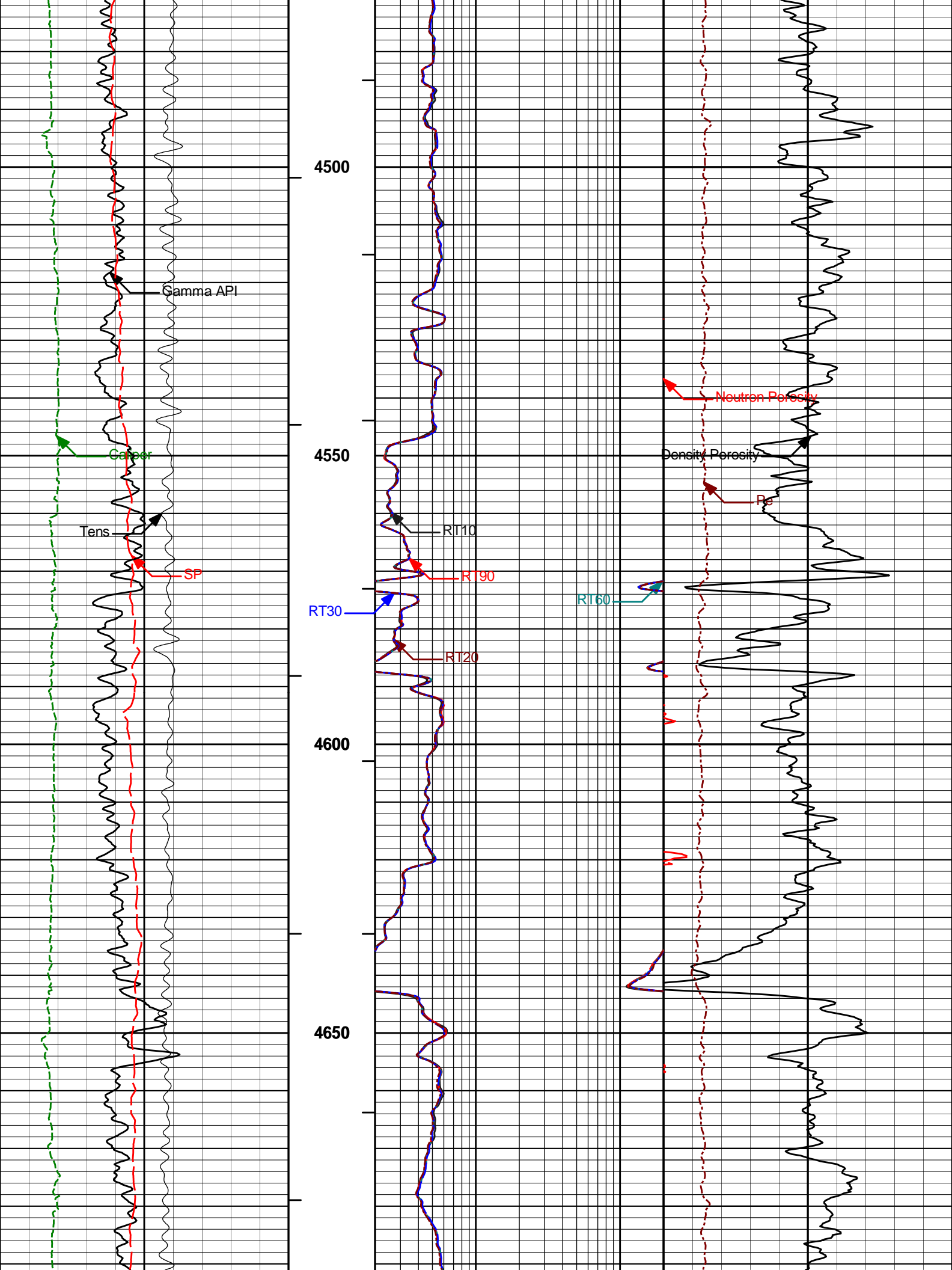
MAIN PASS 5" = 100'

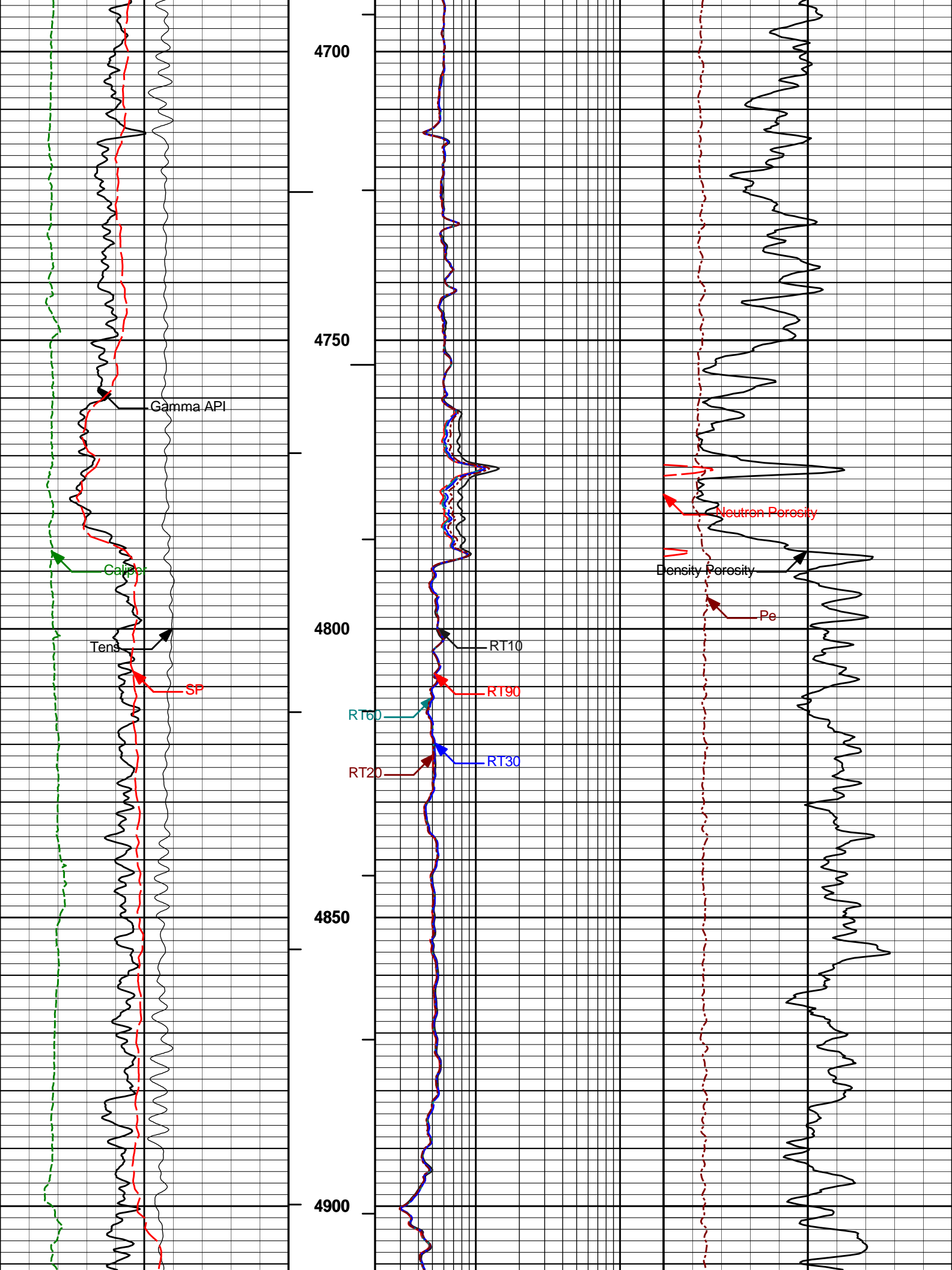
	2	RT10	200	
		ohmm		
<div> <div>Tens</div> <div>0</div> </div>	2	RT20	200	

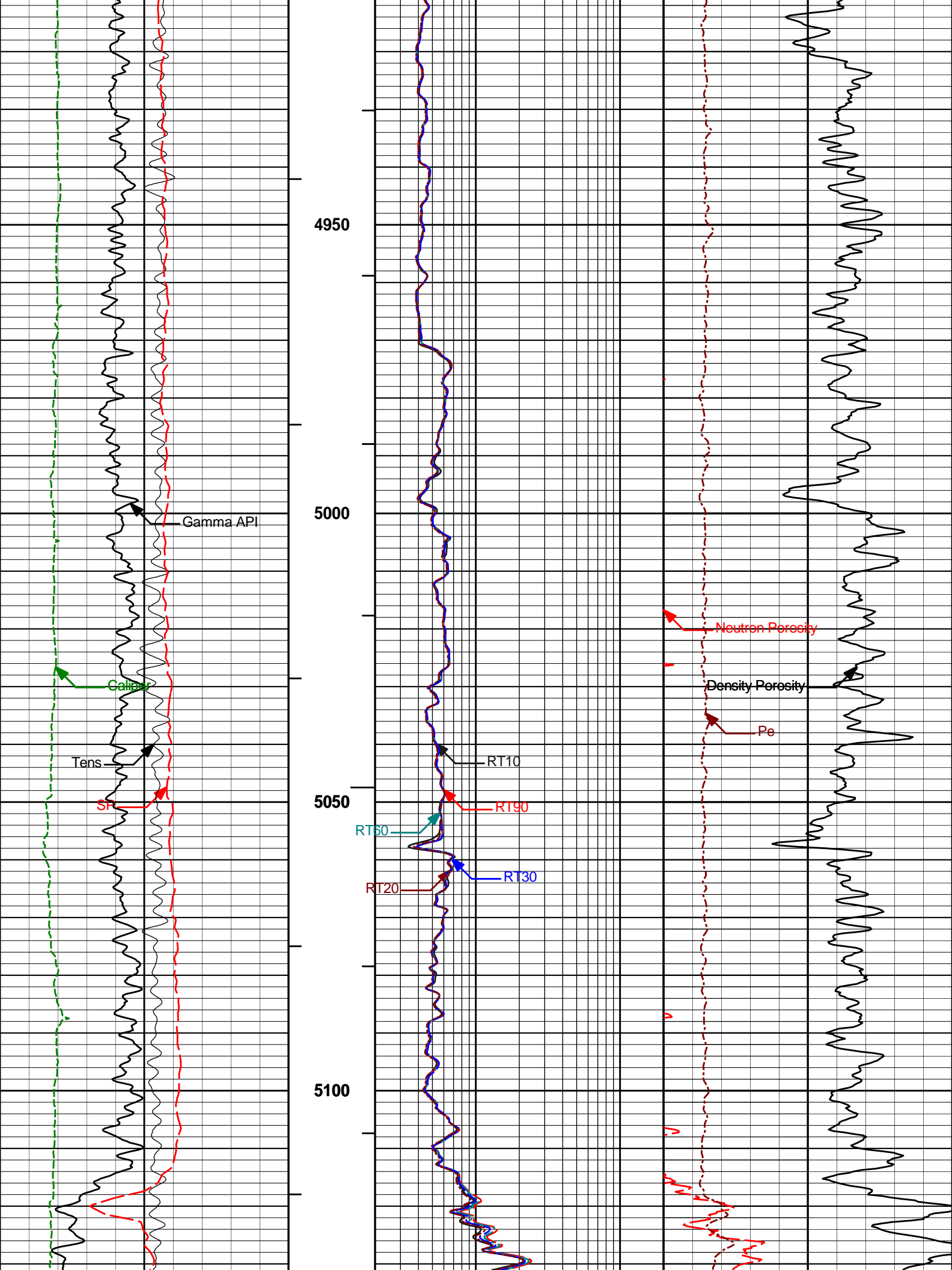


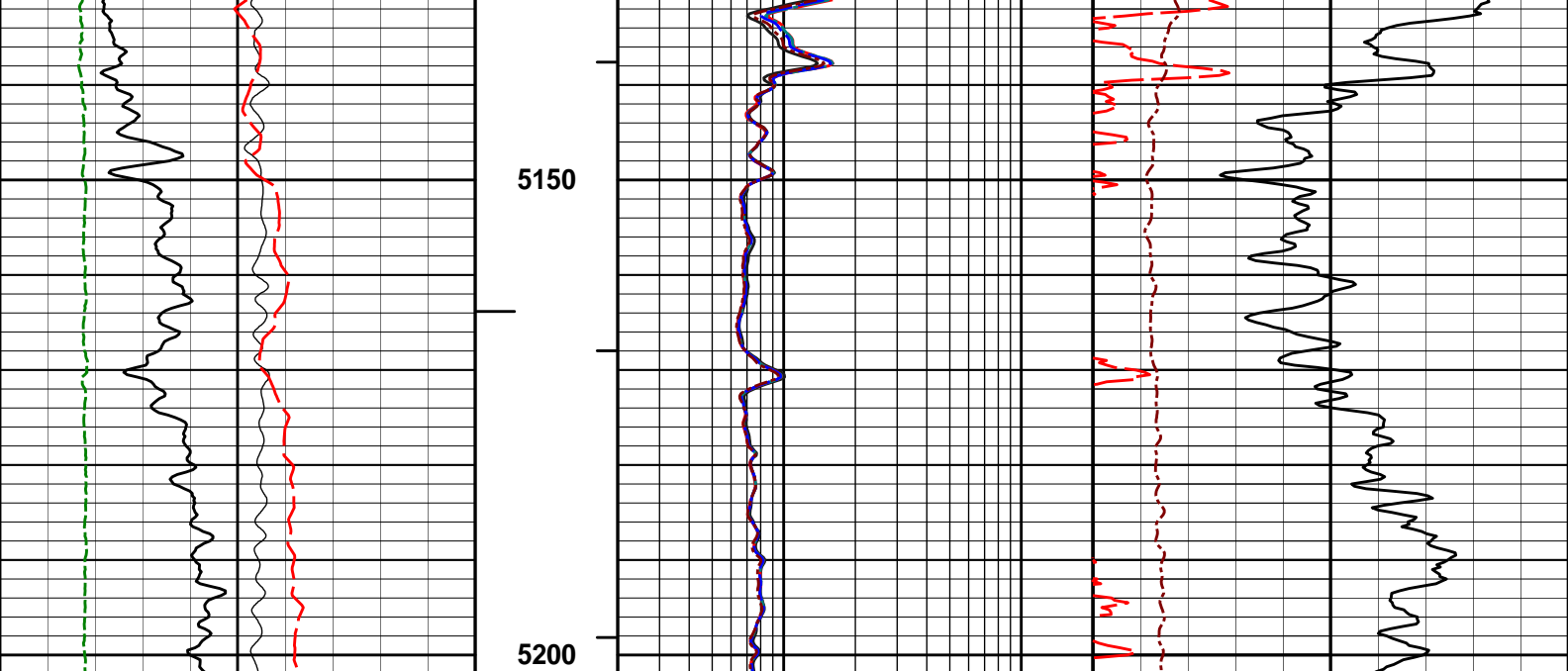












0	SP	100	1 : 240	2	RT90	200	0	Pe	10
	millivolts				ohmm				
0	Gamma API	250	BHVT	2	RT60	200	20	Density Porosity	0
	api				ohmm			percent	
6	Caliper	16	AHVT	2	RT30	200	20	Neutron Porosity	0
	inches				ohmm			percent	
10K	Tens	0		2	RT20	200			
	pounds				ohmm				
				2	RT10	200			
					ohmm				

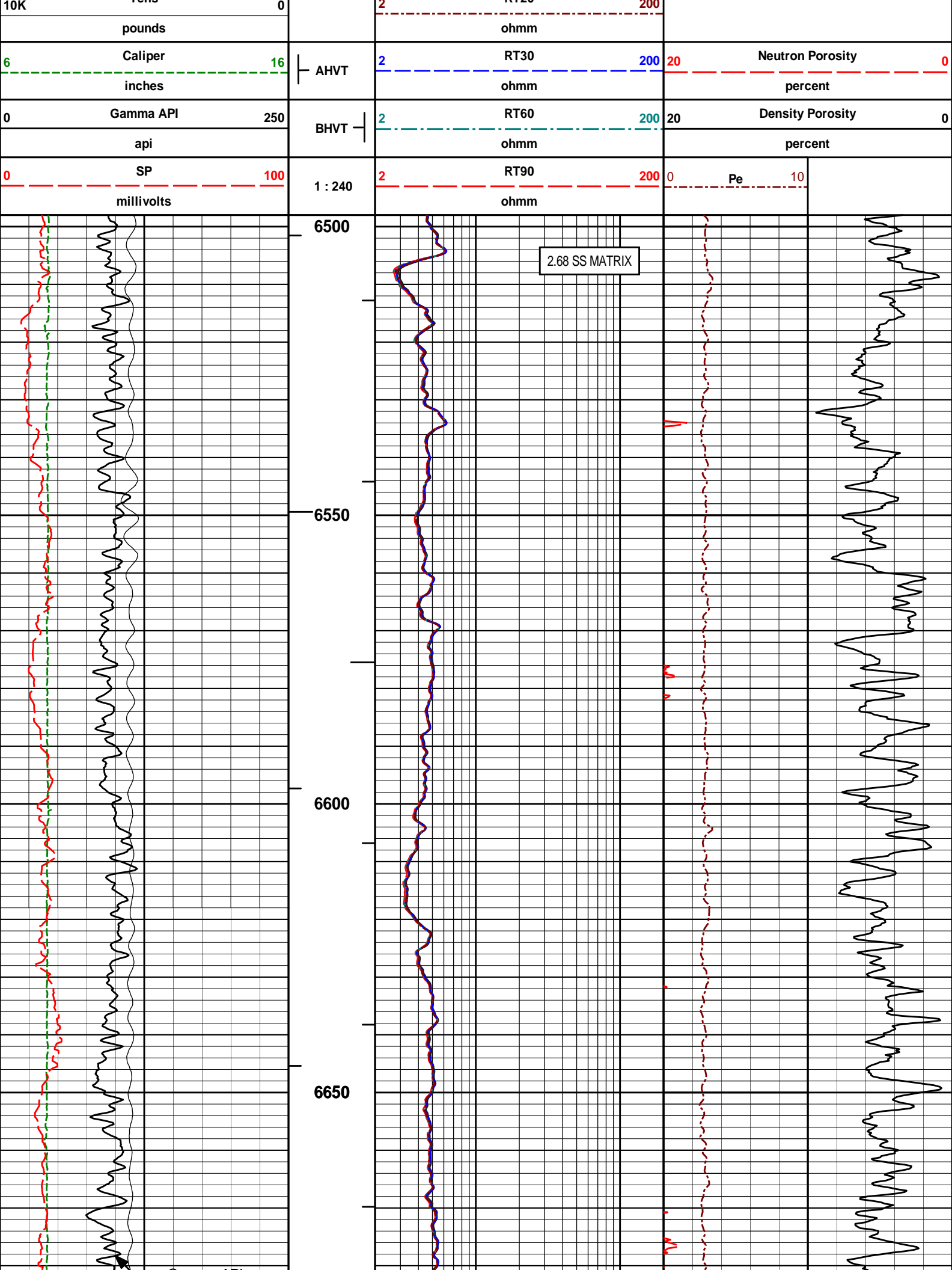
HALLIBURTON Plot Time: 03-Jan-12 02:46:09
Plot Range: 3848 ft to 5202 ft
Data: RH_FAR_IL33-12D\Well Based\MAIN*
Plot File: \\COMP\SUSX-PARK

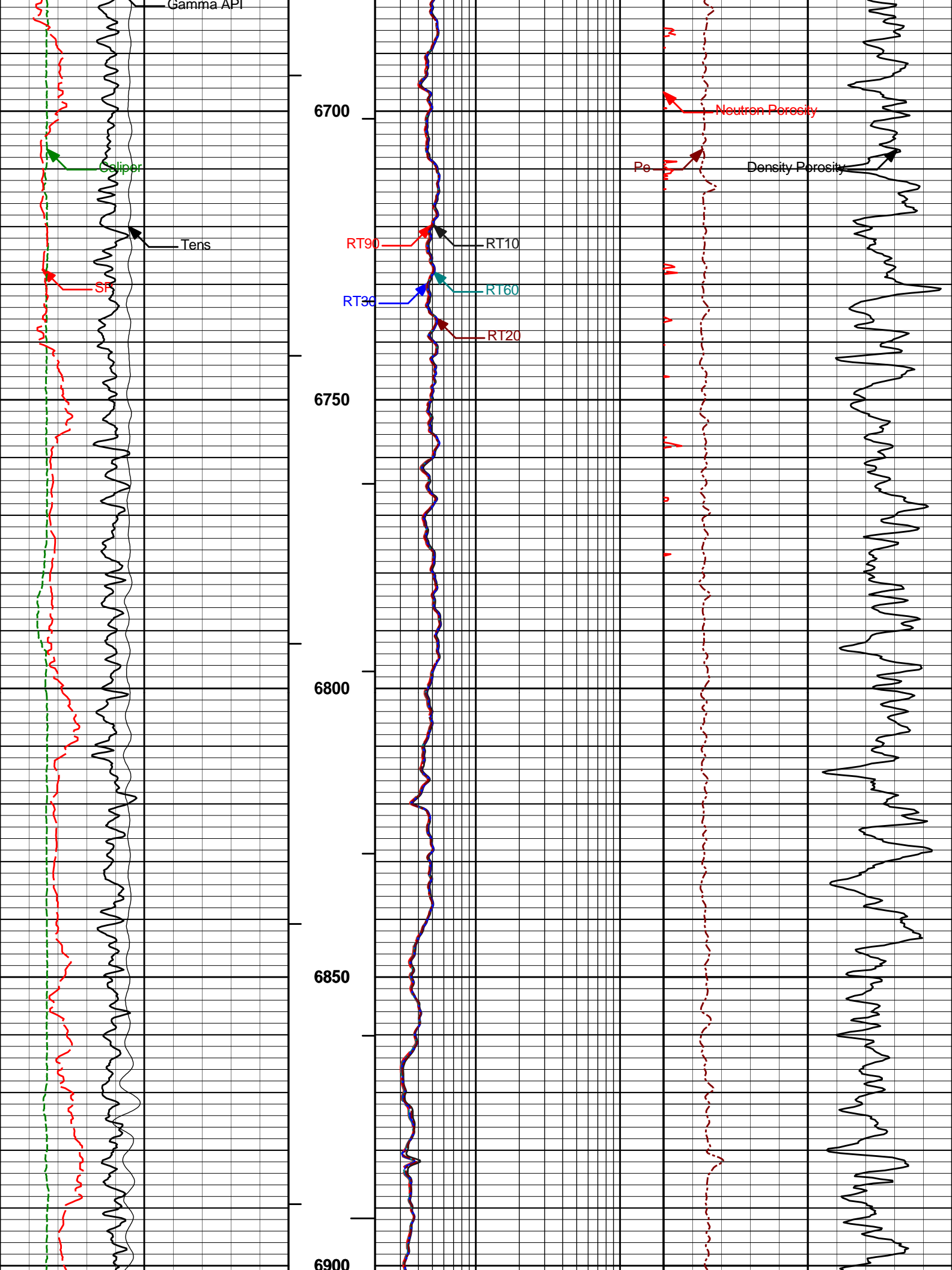
MAIN PASS 5" = 100'

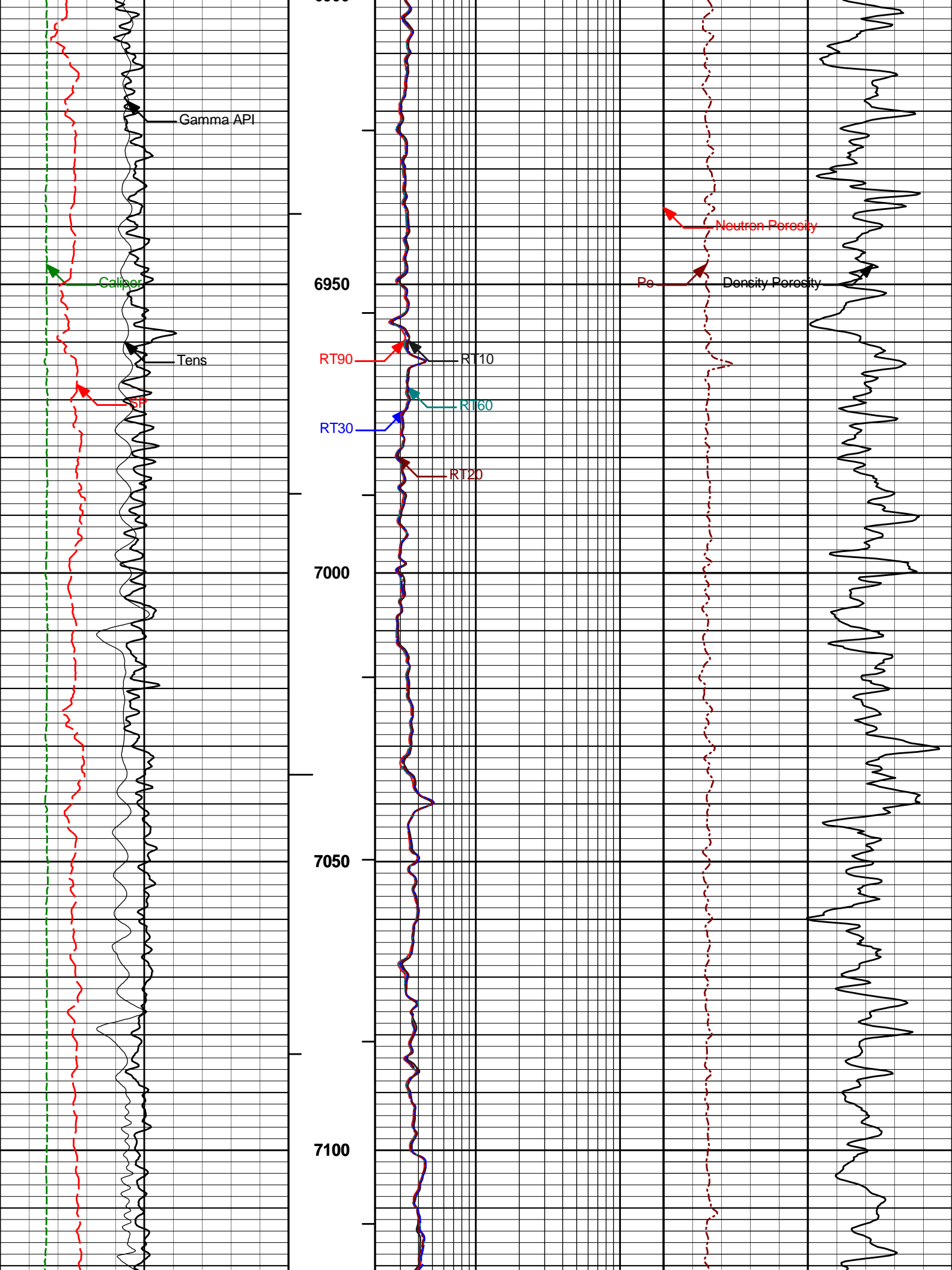
HALLIBURTON Plot Time: 03-Jan-12 02:46:09
Plot Range: 6498 ft to 7697.67 ft
Data: RH_FAR_IL33-12D\Well Based\MAIN*
Plot File: \\COMP\TD-NIO

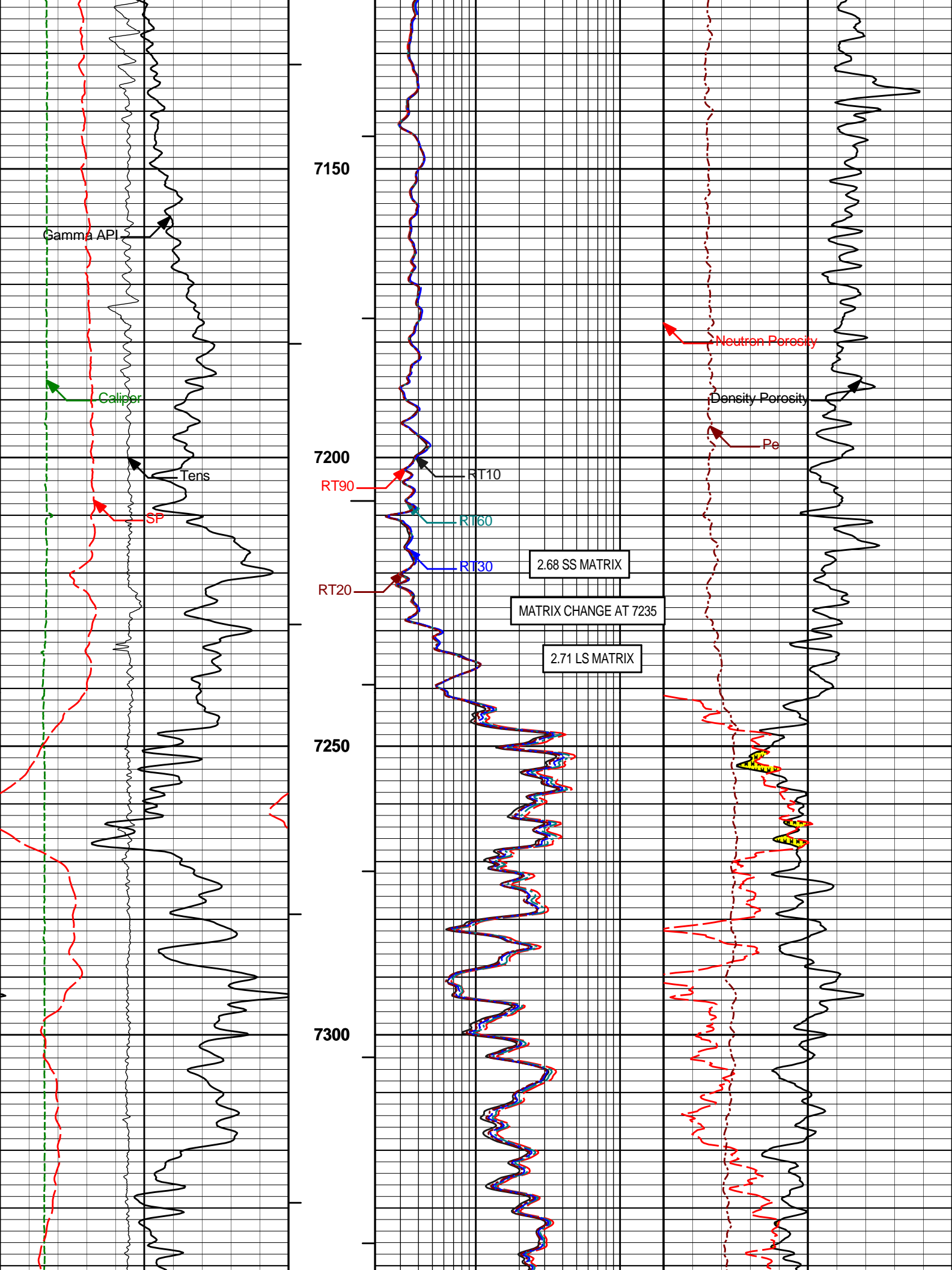
MAIN PASS 5" = 100'

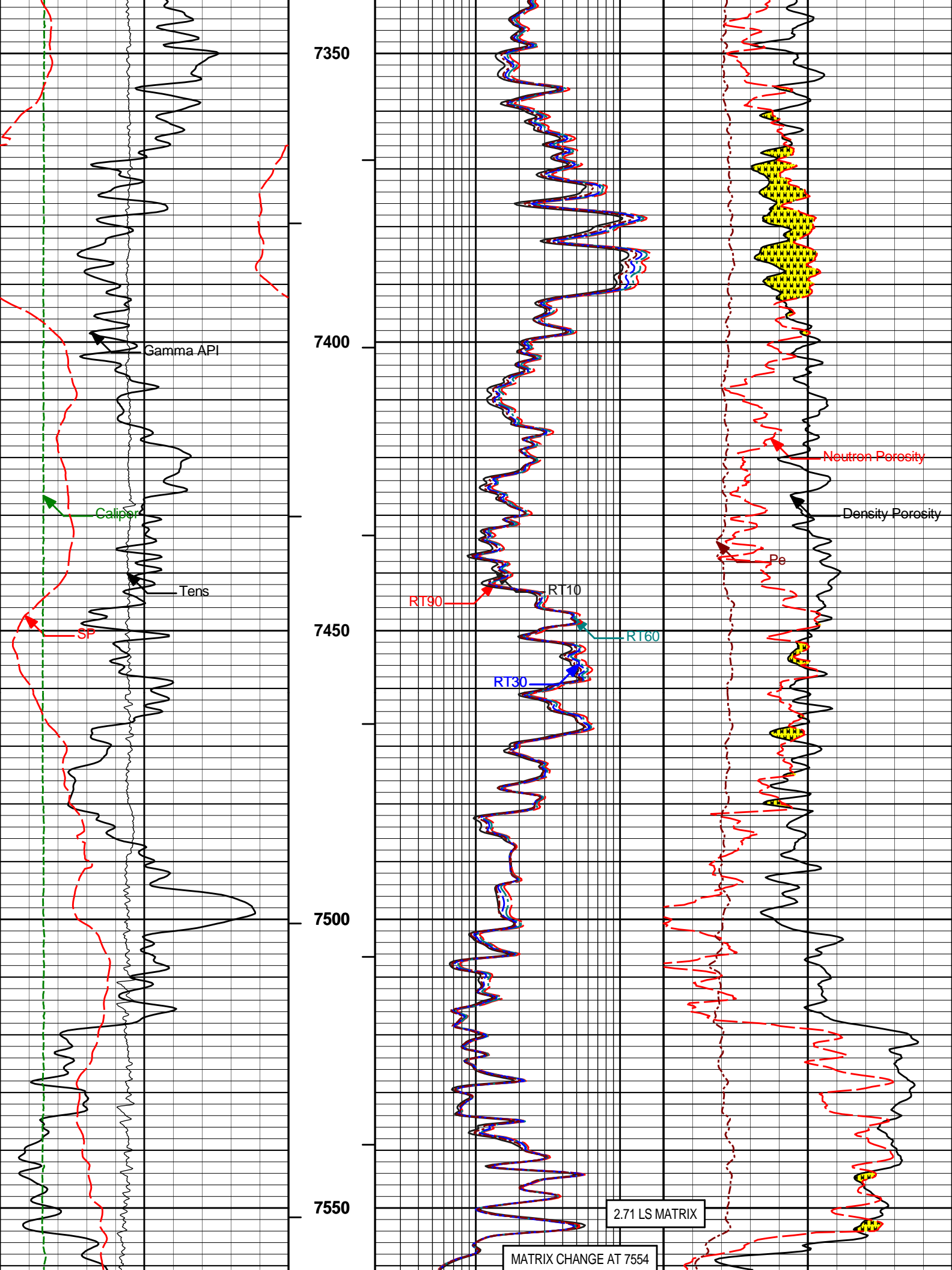
	2	RT10	200	
		ohmm		
Tens	2	RT20	200	

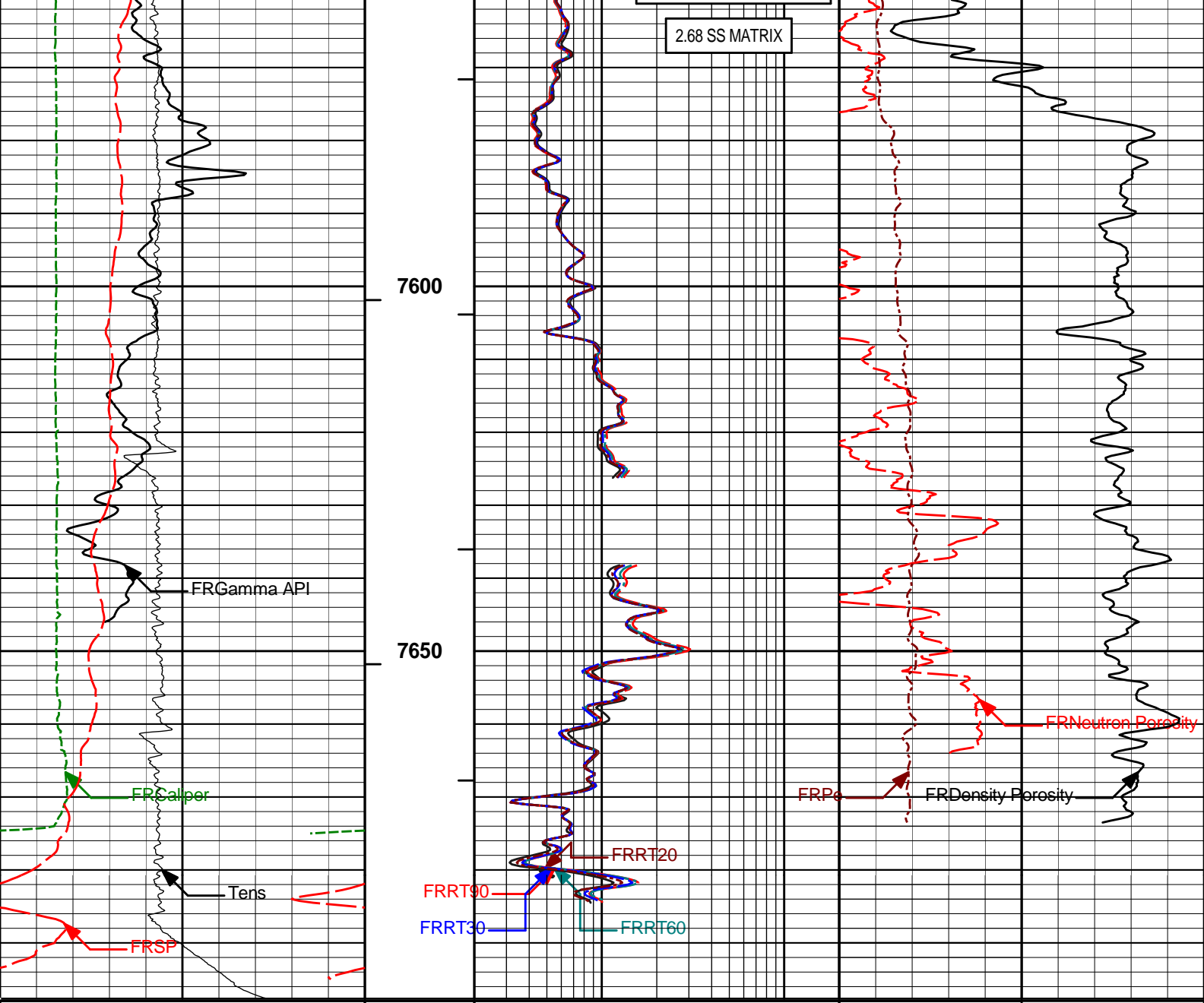












0	SP	100	1 : 240	2	RT90	200	0	Pe	10
	millivolts				ohmm				
0	Gamma API	250	BHVT	2	RT60	200	20	Density Porosity	0
	api				ohmm			percent	
6	Caliper	16	AHVT	2	RT30	200	20	Neutron Porosity	0
	inches				ohmm			percent	
10K	Tens	0		2	RT20	200			
	pounds				ohmm				
				2	RT10	200			
					ohmm				

HALLIBURTON

Plot Time: 03-Jan-12 02:46:11
 Plot Range: 6498 ft to 7697.67 ft
 Data: RH_FAR_IL33-12D\Well Based\MAIN*
 Plot File: \COMP\TD-NIO

MAIN PASS 5" = 100'

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name: GTET - 11277436_BLACK

Reference Calibration Date: 08-Nov-11 13:06:24

Engineer: R. TWEETEN

Calibration Date: 10-Dec-11 12:42:41

Software Version: WL INSITE R3.4.2 (Build 2)

Calibration Version: 1

Calibrator Source S/N: TB-289

Calibrator API Reference:243.00 api

Equivalent Calibrator API Reference:247.3 api

Measurement	Measured	Calibrated	Units
Background	72.9	74.1	api
Background + Calibrator	316.4	321.4	api
Calibrator	243.4	247.3	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name: GTET - 11277436_BLACK

Reference Calibration Date: 10-Dec-11 12:42:41

Engineer: R. TWEETEN

Calibration Date: 02-Jan-12 21:45:58

Software Version: WL INSITE R3.4.2 (Build 2)

Calibration Version: 1

Calibrator Source S/N: TB-289

Calibrator API Reference:243.00 api

Equivalent Calibrator API Reference:247.3 api

Field Verification	Shop	Field	Units
Background	74.1	68.7	api
Background + Calibrator	321.4	317.3	api
Calibrator	247.3	248.6	api

Shop	Field	Difference	Tolerance
247.3	248.6	-1.3	+/- 9.00

CSNG-FS SHOP CALIBRATION

Tool Name: CSNG - 10965402

Reference Calibration Date: 08-Nov-11 14:10:02

Engineer: R. TWEETEN

Calibration Date: 16-Dec-11 08:56:34

Software Version: WL INSITE R3.4.2 (Build 2)

Calibration Version: 1

Source SN: TB-289

TITANIUM CASE	Measured	Calibrated	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	22.8	23.0	Channel #
583 KEV Peak Channel #	51.4	51.7	Channel #
2614 KEV Peak Channel #	211.5	212.1	Channel #
Calibrate Temperature	82.9	64.9	degF

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

Blanket Reference Value: 243.00 API
Calibrator Value: 276.0 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1824.7	CPS	329.6	338.7	API
Background	337.7	CPS	53.6	62.7	API

Gamma Ray Gain: 0.93
Expected Gain Range: 0.85 - 1.15
Gamma Gain Check: Passed

CSNG-FS FIELD CALIBRATION

Tool Name:	CSNG - 10965402	Reference Calibration Date:	16-Dec-11 08:56:34
Engineer:	R. TWEETEN	Calibration Date:	02-Jan-12 21:52:59
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1
Source SN:			

TITANIUM CASE	Shop	Field	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	23.0	22.8	Channel #
583 KEV Peak Channel #	51.7	51.1	Channel #
2614 KEV Peak Channel #	212.1	210.3	Channel #
Calibrate Temperature	64.9	96.3	degF

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

Blanket Reference Value: 243.00 API
Calibrator Value: 276.0 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1823.7	CPS	338.7	335.0	API
Background	321.5	CPS	62.7	59.1	API

Gamma Ray Gain: 0.92
Expected Gain Range: 0.85 - 1.15
Gamma Gain Check: Passed

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	DSNT - 11812167	Reference Calibration Date:	08-Nov-11 11:49:03
Engineer:	R. TWEETEN	Calibration Date:	11-Dec-11 12:48:31
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

Logging Source S/N: DSN434
Tank Serial Number: 11068236
Reference value assigned to Tank: 53.720
Snow Block S/N: BRIGHTON
Calibration Tank Water Temperature: 68 degF
Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS

Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.998	0.993	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):	0.2238	0.2224	0.0015	+/- 0.0020
Calibrated Ratio:	10.16	10.11	0.050	+/- 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 - 11812167	Reference Calibration Date:	11-Dec-11 12:48:31
Engineer:	R. TWEETEN	Calibration Date:	02-Jan-12 22:03:17
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

Logging Source S/N: DSN434
Snow Block S/N: BRIGHTON

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0766	0.0775	0.0009	+/- 0.0150

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

DENSITY CALIPER SHOP CALIBRATION			
Tool Name:	SDLT - M335_P470_BLACK	Reference Calibration Date:	11-Dec-11 13:56:41
Engineer:	R. TWEETEN	Calibration Date:	11-Dec-11 14:04:36
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-3444.37	-3352.91	-7000.00 - -1000.00
Pad Gain	0.0003910	0.0003872	0.000200 - 0.000600
Arm Offset	-4160.69	-4206.13	-5000.00 - 3000.00
Arm Gain	0.0005558	0.0005565	0.000300 - 0.000700
Arm Power	-0.000005030	-0.000004966	-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:				

PAD EXTENSION:				
Small Ring (in)	1.98	2.00	0.02	+/- 0.20
Medium Ring (in)	3.75	3.75	0.00	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.49	6.50	0.01	+/- 0.20
Medium Ring (in)	8.23	8.25	0.02	+/- 0.20
Large Ring (in)	14.96	15.00	0.04	+/- 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 - M335_P470_BLACK		Reference Calibration Date:	11-Dec-11 14:04:36
Engineer:	R. TWEETEN		Calibration Date:	02-Jan-12 21:58:32
Software Version:	WL INSITE R3.4.2 (Build 2)		Calibration Version:	1

MEASURED CALIPER VALUES				
Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.67	-0.08	+/- 0.10
Ring Diameter	8.25	8.19	-0.06	+/- 0.15
PASS/FAIL SUMMARY				
Pad Extension Check:			Passed	
Diameter Check:			Passed	

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION				
Tool Name:	ACRt Sonde - E6758-S4352_BLK		Reference Calibration Date:	30-Mar-11 17:55:22
Engineer:	F. LODER		Calibration Date:	25-Aug-11 15:55:48
Software Version:	WL INSITE R3.4.2 (Build 2)		Calibration Version:	1

TYPICAL GAIN RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	0.9901	1.05	0.95	0.9958	1.05	0.95	0.9928	1.05
A2 (50")	0.95	0.9949	1.05	0.95	1.0010	1.05	0.95	1.0001	1.05
A3 (29")	0.95	0.9960	1.05	0.95	0.9995	1.05	0.95	0.9971	1.05
A4 (17")	0.95	1.0044	1.05	0.95	1.0055	1.05	0.95	1.0047	1.05
A5 (10")	N/A	N/A	N/A	0.95	0.9980	1.05	0.95	0.9966	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9787	1.05	0.95	0.9757	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	-1.494	2	-6	-3.982	-2	-8	-4.283	-2
A2 (50")	-7	-3.247	-1	-6	-3.938	-2	-7	-4.224	-2
A3 (29")	-27	-13.938	-9	-9	-3.943	-3	-7	-2.988	-1
A4 (17")	-180	-98.155	-60	-45	-31.951	-15	-39	-25.455	-13
A5 (10")	N/A	N/A	N/A	-150	-92.229	-50	-80	-45.352	-10
A6 (6")	N/A	N/A	N/A	175	299.783	525	90	150.888	270

TRANSMITTER CURRENT GAIN				R-MUD VERIFICATION			
Signal	Lower	R	Upper	Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
12K	0.6	0.9246	1.3	Mud Cell	0.95	1.009	1.05
36K	1.0	1.8754	2.0				
72K	1.0	1.1579	2.0				

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name: SDLT Pad - M335_P470_BLACK

Engineer: R. TWEETEN

Software Version: WL INSITE R3.4.2 (Build 2)

Reference Calibration Date: 08-Nov-11 13:37:53

Calibration Date: 11-Dec-11 13:28:20

Calibration Version: 1

Logging Source S/N: 2770GW

Aluminum Block S/N: 63066

Magnesium Block S/N: 12345

Density: 2.602g/cc

Density: 1.690g/cc

Pe: 3.100

Pe: 2.650

DENSITY CALIBRATION SUMMARY

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0862	1.0836	0.90 - 1.10
Near Dens Gain	1.0467	1.0367	0.90 - 1.10
Near Peak Gain	1.0177	1.0329	0.90 - 1.10
Near Lith Gain	0.9729	0.9778	0.90 - 1.10
Far Bar Gain	1.0203	1.0141	0.90 - 1.10
Far Dens Gain	1.0052	0.9996	0.90 - 1.10
Far Peak Gain	0.9985	0.9936	0.90 - 1.10
Far Lith Gain	0.9674	0.9677	0.90 - 1.10
Near Bar Offset	-0.5413	-0.5096	NONE
Near Dens Offset	-0.1421	-0.0476	NONE
Near Peak Offset	0.1151	-0.0007	NONE
Near Lith Offset	0.4614	0.4479	NONE
Far Bar Offset	0.0377	0.0923	NONE
Far Dens Offset	0.1472	0.1995	NONE
Far Peak Offset	0.1890	0.2380	NONE
Far Lith Offset	0.4001	0.4085	NONE
Near Bar Background	1046.79	1050.36	700 - 1450
Near Dens Background	345.57	344.83	230 - 480
Near Peak Background	152.19	150.25	100 - 210
Near Lith Background	183.15	182.31	125 - 260
Far Bar Background	545.59	547.54	450 - 900
Far Dens Background	214.11	213.77	175 - 345
Far Peak Background	83.42	82.59	70 - 140
Far Lith Background	87.41	86.89	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.683	1.690	0.007	+/- 0.015
Pe	2.728	2.592	-0.136	+/- 0.150
ALUMINUM				
Density (g/cc)	2.600	2.602	0.002	+/- 0.01500
Pe	3.163	3.050	-0.113	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0006	+/- 0.0110	-0.0008	+/- 0.0140
Magnesium Block	-0.0012	+/- 0.0110	-0.0001	+/- 0.0140
Aluminum Block	-0.0004	+/- 0.0110	0.0008	+/- 0.0140
Resolution	9.07	6.00 - 11.50	9.83	6.00 - 11.50
Internal Verifier(B+D+P+L)	1728	1200 - 2700	931	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 - M335_P470_BLACK		Reference Calibration Date:	11-Dec-11 13:28:20
Engineer:	R. TWEETEN		Calibration Date:	02-Jan-12 21:45:09
Software Version:	WL INSITE R3.4.2 (Build 2)		Calibration Version:	1

Pad Temperature: 61.1 degF				
DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1727.751	1731.232	3.481	16.676
Far (B+D+P+L) cps	930.797	932.812	2.015	16.506
Near Resolution	9.07	9.01	-0.060	0.50
Far Resolution	9.83	9.84	0.010	1.00
PASS/FAIL SUMMARY				
Bkg Quality Check:			Passed	
Bkg Resolution Check:			Passed	
Bkg Verification Check:			Passed	

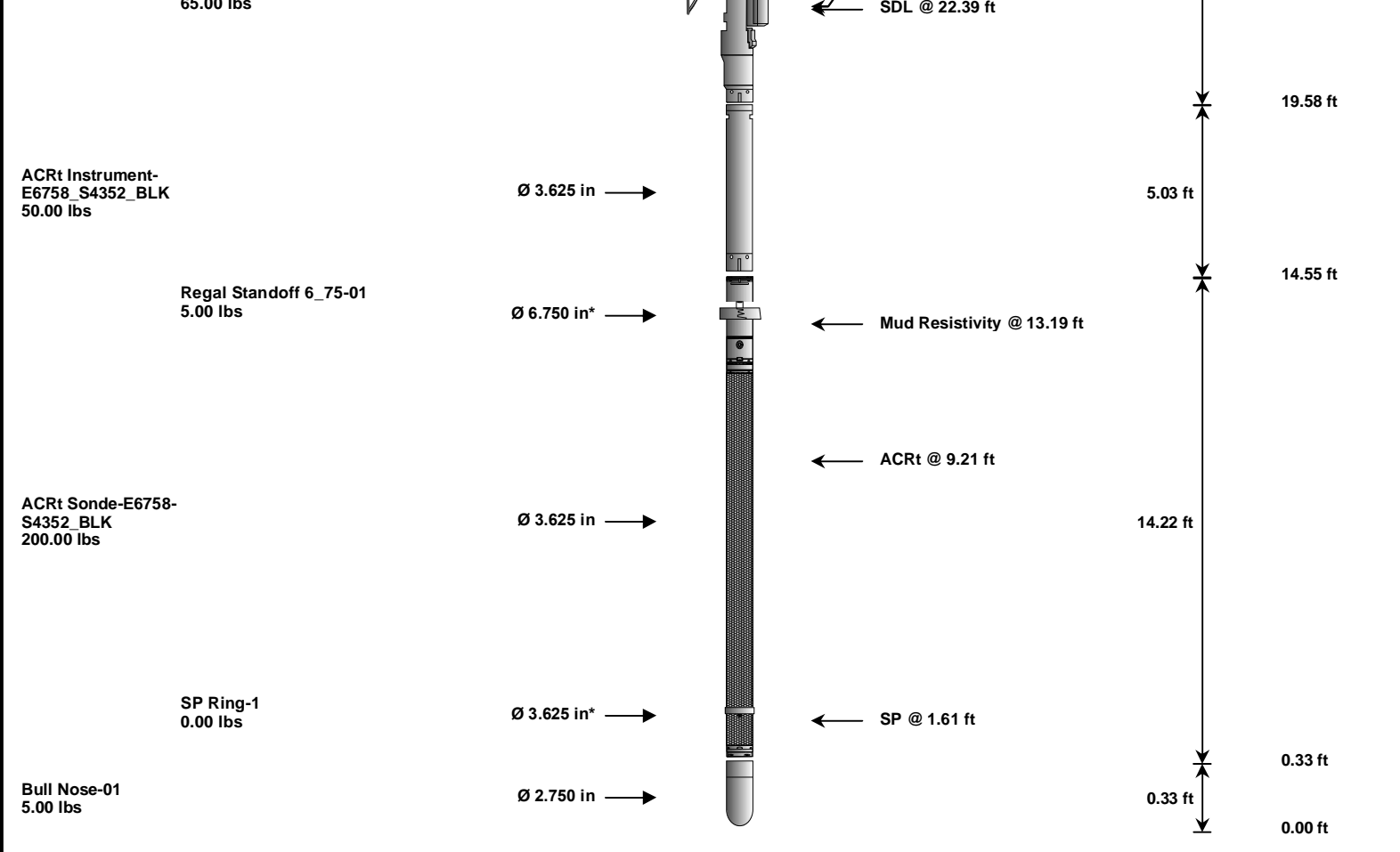
CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11277436_BLACK						
Gamma Ray Calibrator	247.3	248.6	-----	-1.3	+/- 9.00	api
CSNG-10965402						
60 KEV Peak Channel #	48.0	48.0	-----	0.0	-----	Channel #
239 KEV Peak Channel #	23.0	22.8	-----	0.2	-----	Channel #
583 KEV Peak Channel #	51.7	51.1	-----	0.6	-----	Channel #
2614 KEV Peak Channel #	212.1	210.3	-----	1.8	-----	Channel #
DSNT-11812167						
Snow-Block Porosity	0.0766	0.0775	-----	-0.0009	+/- 0.0150	decp
SDLT-M335_P470_BLACK						
Pad Extension	3.75	3.67	-----	0.08	+/-0.10	in
Ring Diameter	8.25	8.19	-----	0.060	+/-0.15	in

Ring Diameter:	0.120	0.110	0.000	0.000	0.000	0.000
ACRt Sonde-E6758-S4352_BLK						
Mud Cell	1.009	-----	-----	0.000	-----	ohm-m
SDLT Pad-M335_P470_BLACK						
Near(B+D+P+L)	1727.751	1731.232	-----	-3.481	+/-16.676	cps
Far(B+D+P+L)	930.797	932.812	-----	-2.015	+/-16.506	cps
Data: RH_FAR_II33-12D\0001 NOBLEVDLE				Date: 03-Jan-12 02:19:11		

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 →		← Load Cell @ 59.34 ft ← BH Temperature @ 58.77 ft	6.25 ft	63.02 ft
GTET-11277436_BLACK 165.00 lbs		Ø 3.625 in →		← GammaRay @ 50.71 ft	8.52 ft	56.77 ft
CSNG-10965402 114.00 lbs		Ø 3.625 in →		← CSNG @ 42.62 ft	8.17 ft	48.25 ft
DSNT-11812167 174.00 lbs	DSN Decentralizer-11812167 6.60 lbs	Ø 5.000 in* → Ø 3.625 in →		← DSN Far @ 33.15 ft ← DSN Near @ 32.40 ft	9.69 ft	40.08 ft
SDLT-M335_P470_BLACK 360.00 lbs	SDLT Pad-M335_P470_BLACK	Ø 4.500 in → Ø 4.750 in* →		SDL Caliper @ 22.40 ft	10.81 ft	30.40 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	56.77	300.00
GTET	Gamma Telemetry Tool		11277436_BLACK	165.00	8.52	48.25	60.00
CSNG	Compensated Spectral Natural Gamma		10965402	114.00	8.17	40.08	15.00
DSNT	Dual Spaced Neutron		11812167	174.00	9.69	30.40	60.00
DCNT	DSN Decentralizer		11812167	6.60	5.13	*	33.73
SDLT	Spectral Density Tool		M335_P470_BLACK	360.00	10.81	19.58	60.00
SDLP	Density Insite Pad		M335_P470_BLACK	65.00	2.55	*	21.79
ACRt	Array Compensated True Resistivity Instrument Section		E6758_S4352_BLK	50.00	5.03	14.55	300.00
ACRt	Array Compensated True Resistivity		E6758-S4352_BLK	200.00	14.22	0.33	300.00
SP	SP Ring		1	0.00	0.25	*	1.61
RSOF	Regal Standoff 6.75in		01	5.00	0.52	*	13.24
BLNS	Bull Nose		01	5.00	0.33	0.00	300.00
Total				1,279.60	63.02		
* Not included in Total Length and Length Accumulation.							
Data: RH_FAR_II33-12D\0001 NOBLE\IDLE							
Date: 03-Jan-12 00:47:02							

COMPANY	NOBLE ENERGY INC		
WELL	RH FARMS II33-12D		
FIELD	WATTENBERG		
COUNTY	WELD	STATE	CO
HALLIBURTON		ARRAY COMPENSATED TRUE RESISTIVITY SPECTRAL DENSITY DUAL SPACED NEUTRON	