HALLIBURTON

SPECTRAL DENSITY
DUAL SPACED NEUTRON
ARRAY COMPENSATED
TRUE RESISTIVITY

COMPANY NOBLE ENERGY INC.
WELL CRICKET C22-30D
FIELD WATTENBERG
COUNTY WELD
STATE CO

COMPANY	NOBLE ENERGY INC.
WELL	CRICKET C22-30D
FIELD	WATTENBERG
COUNTY	WELD STATE CO

API No. 05123320700000

Location SURFACE: 715' FNL & 610' FEL NENE
BOTTOM: 89' FNL & 64' FEL NENE
LAT: 40.30319º N
LONG: 104.54845º W

Sect. 21 Twp. 4N Rge. 64W

Other Services:
CSNG

Permanent Datum	GL	Elev. 4687.0 ft	Elev.: K.B.	4702.0 ft
Log measured from	KB	15.0 ft above perm. Datum	D.F.	4701.0 ft
Drilling measured from	KB		G.L.	4687.0 ft

Date		07-Apr-11					
Run No.		ONE					
Depth - Driller		7135.00 ft					
Depth - Logger		7007.0 ft					
Bottom - Logged Interval		6998.0 ft					
Top - Logged Interval		CASING					
Casing - Driller		8.625 in @ 620.0 ft		@		@	
Casing - Logger		622.0 ft					
Bit Size		7.875 in		@		@	
Type Fluid in Hole		WATER BASED MUD					
Density	Viscosity	9.4 ppg	40.00 s/qt				
PH	Fluid Loss	8.00 pH					
Source of Sample		MUD CELL					
Rm @ Meas. Temperature		1.310 ohmm @ 75.00 degF		@		@	
Rmf @ Meas. Temperature		1.25 ohmm @ 75.00 degF		@		@	
Rmc @ Meas. Temperature		1.540 ohmm @ 75.00 degF		@		@	
Source Rmf	Rmc	CHART	CHART				
Rm @ BHT		0.50 ohmm @ 208.0 degF		@		@	
Time Since Circulation		7.5 hr					
Time on Bottom		07-Apr-11 23:59					
Max. Rec. Temperature		208.0 degF @ 7007.0 ft		@		@	
Equipment	Location	11454566	BRIGHTON				
Recorded By		C. GULLETT					
Witnessed By		B. HANSEN					

Fold here

Service Ticket No.: 8092540 API Serial No.: 05123320700000 PGM Version: WL INSITE R3.2.3 (Build 5)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE					
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 SCALE CHANGES			
Type Log	Depth	Scale Up Hole	Scale Down Hole

RESISTIVITY EQUIPMENT DATA				
Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other
ONE	ACRt-	N/A	1.5" STANDOFF	N/A
	E2817-S4353			

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.		Run No.	ONE	Run No.	ONE
Serial No.	11294346	Serial No.		Serial No.	M335-P470	Serial No.	10958655
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.	102-T	Spacing		Log Type	GAMMA-GAMMA	Log Type	THERMAL
Type	SCINT.			Source Type	Cs137	Source Type	Am241Be
Length	8"	LSA [Y/N]		Serial No.	2770GW	Serial No.	DSN-434
Distance to Source	17'	FWDA [Y/N]		Strength	1.5 Ci	Strength	15 Ci

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	T.D.	6940	REC.	0	250				20%	0%	2.68	20%	0%	SAND
ONE	6940	6679	REC.	0	250				20%	0%	2.71	20%	0%	LIME
ONE	6679	CSG.	REC.	0	250				20%	0%	2.68	20%	0%	SAND

DIRECTIONAL INFORMATION

Maximum Deviation	@	KOP	@

Remarks:

RWCH-GTET-CSNG-DSNT-SDLT-ACRt WERE RAN IN COMBINATION.

A.H.V. CALCULATED FOR 4.5" CASING.

CHLORIDES REPORTED AT 700 ppm.

DRILLERS T.D. NOT REACHED DUE TO HOLE CONDITIONS.

YOUR CREW TODAY: G. DAVIS, A. DUNCAN, R. CHERVENAK.

THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES - BRIGHTON, CO - (303)-825-4346.

HALLIBURTON

PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	DSNT	NLIT	Neutron Lithology	Sandstone	
	SDLT	DMA	Formation Density Matrix	2.680	g/cc
6679.00					
	DSNT	NLIT	Neutron Lithology	Limestone	
	SDLT	DMA	Formation Density Matrix	2.710	g/cc
6940.00					
	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	9.400	ppg
	SHARED	WAGT	Weighting Agent	Barite	
	SHARED	BSAL	Borehole salinity	0.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	2.000	ohmm
	SHARED	TRM	Temperature of Mud	75.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	4.500	in
	SHARED	ST	Surface Temperature	45.0	degF
	SHARED	TD	Total Well Depth	7135.00	ft
	SHARED	BHT	Bottom Hole Temperature	200.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	

SHARED	TEMM	Temperature Master Tool	NONE	
SHARED	BHSM	Borehole Size Master Tool	NONE	
GTET	GROK	Process Gamma Ray?	Yes	
GTET	GRSO	Gamma Tool Standoff	0.000	in
GTET	GEOK	Process Gamma Ray EVR?	No	
GTET	TPOS	Tool Position	Centered	
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	
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	DNOK	Process Density?	Yes	
SDLT	DNOK	Process Density EVR?	No	
SDLT	CB	Logging Calibration Blocks?	No	
SDLT	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT	DTWN	Disable temperature warning	No	
SDLT	DMA	Formation Density Matrix	2.680	g/cc
SDLT	DFL	Formation Density Fluid	1.000	g/cc
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT	MLOK	Process MicroLog Outputs?	Yes	
ACRt	RTOK	Process ACRt?	Yes	
ACRt	MNSO	Minimum Tool Standoff	1.50	in
ACRt	TCS1	Temperature Correction Source	FP Lwr & FP Upr	
ACRt	TPOS	Tool Position	Free Hanging	
ACRt	RMOP	Rmud Source	Mud Cell	
ACRt	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt	THQY	Threshold Quality	0.50	

BOTTOM

Data: CRICKET_C22_30D\0001 NOBLE_BLACK\002.01 07-Apr-11 23:51 Up **Date: 08-Apr-11 00:27:06**

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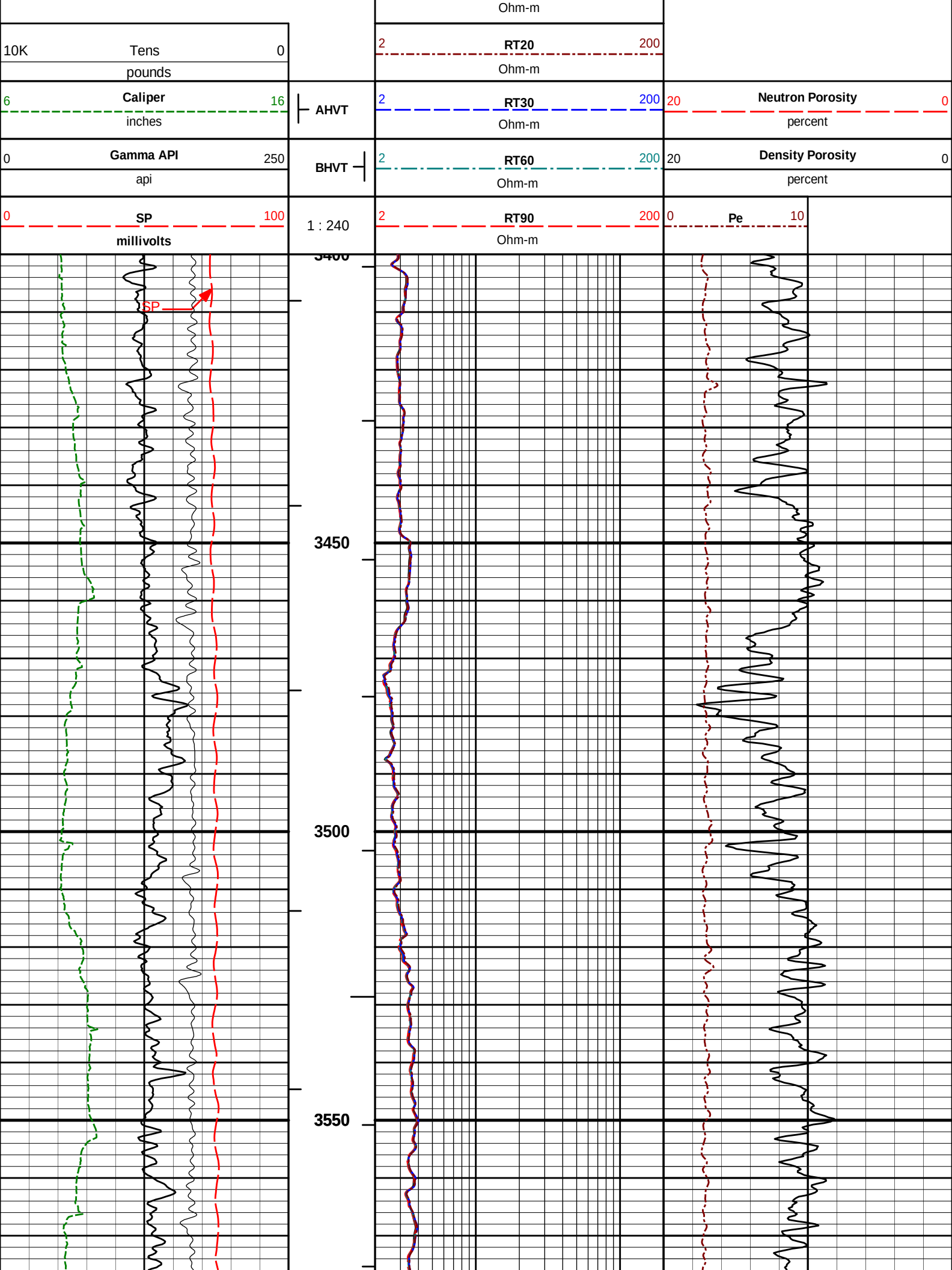
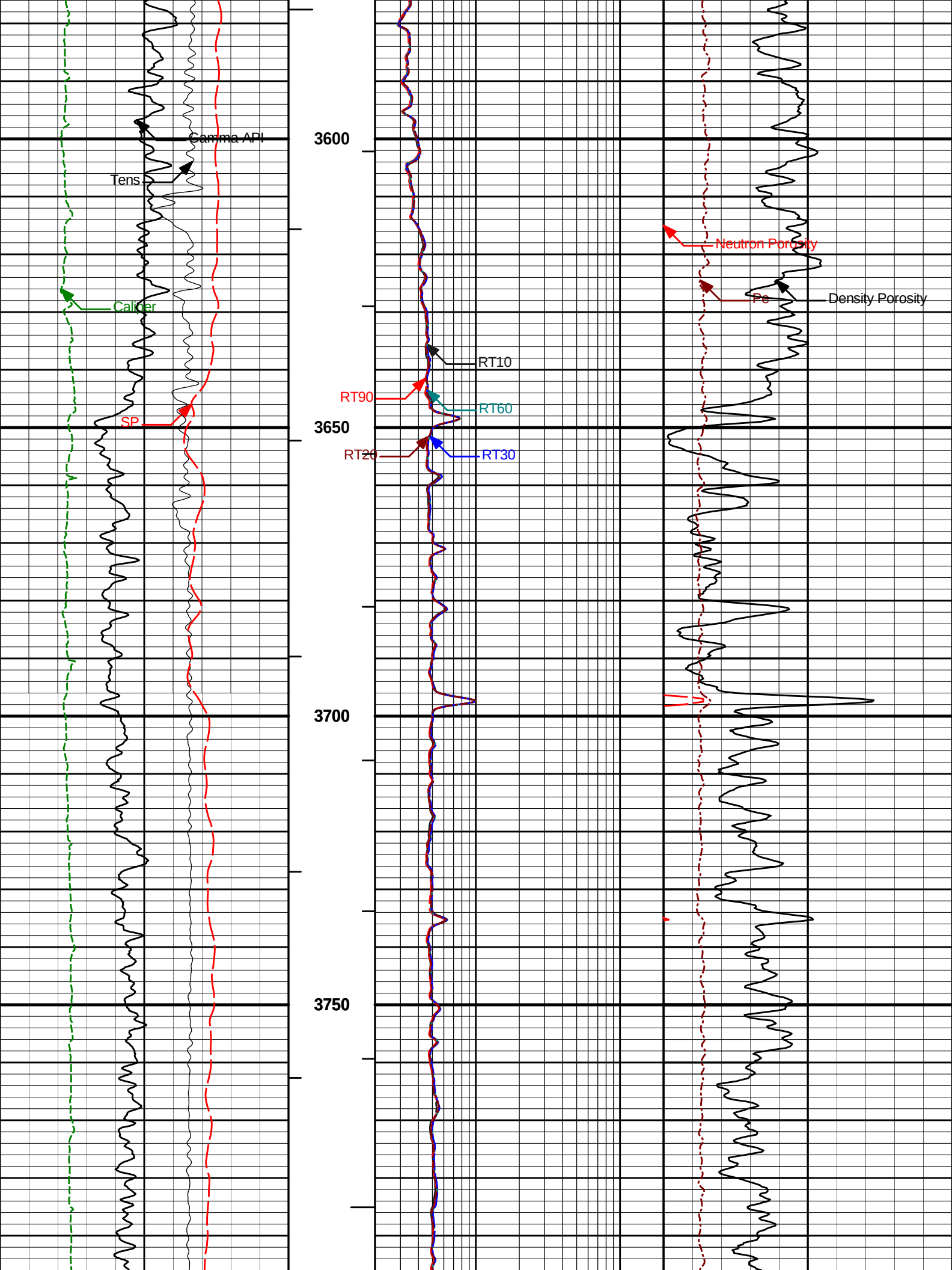
Plot Time: 08-Apr-11 01:36:24
Plot Range: 3400 ft to 4950 ft
Data: {ActiveWell}\Well Based\MAIN*
Plot File: \\COMP\MAIN

MAIN PASS 5" = 100'

Track 1	Depth Track	Track 2	Track 5	Track 3
		2 **RT10** 200		


Ohm-m
10K
Tens
0
pounds
2
RT20
200
Ohm-m
6
Caliper
16
inches
AHVT
2
RT30
200
Ohm-m
20
Neutron Porosity
0
percent
0
Gamma API
250
api
BHVT
2
RT60
200
Ohm-m
20
Density Porosity
0
percent
0
SP
100
millivolts
1 : 240
2
RT90
200
Ohm-m
0
Pe
10
SP
3450
3500
3550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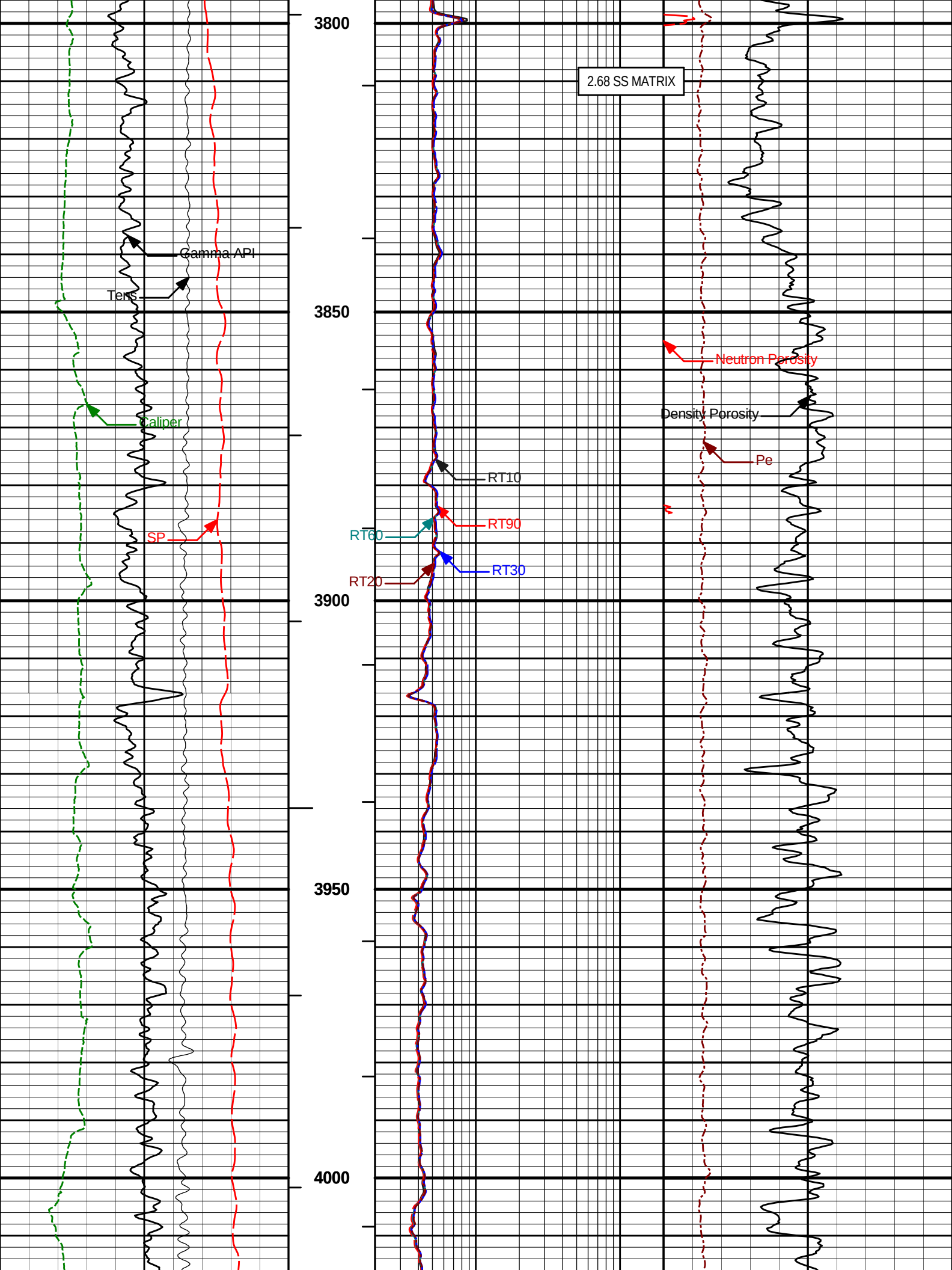
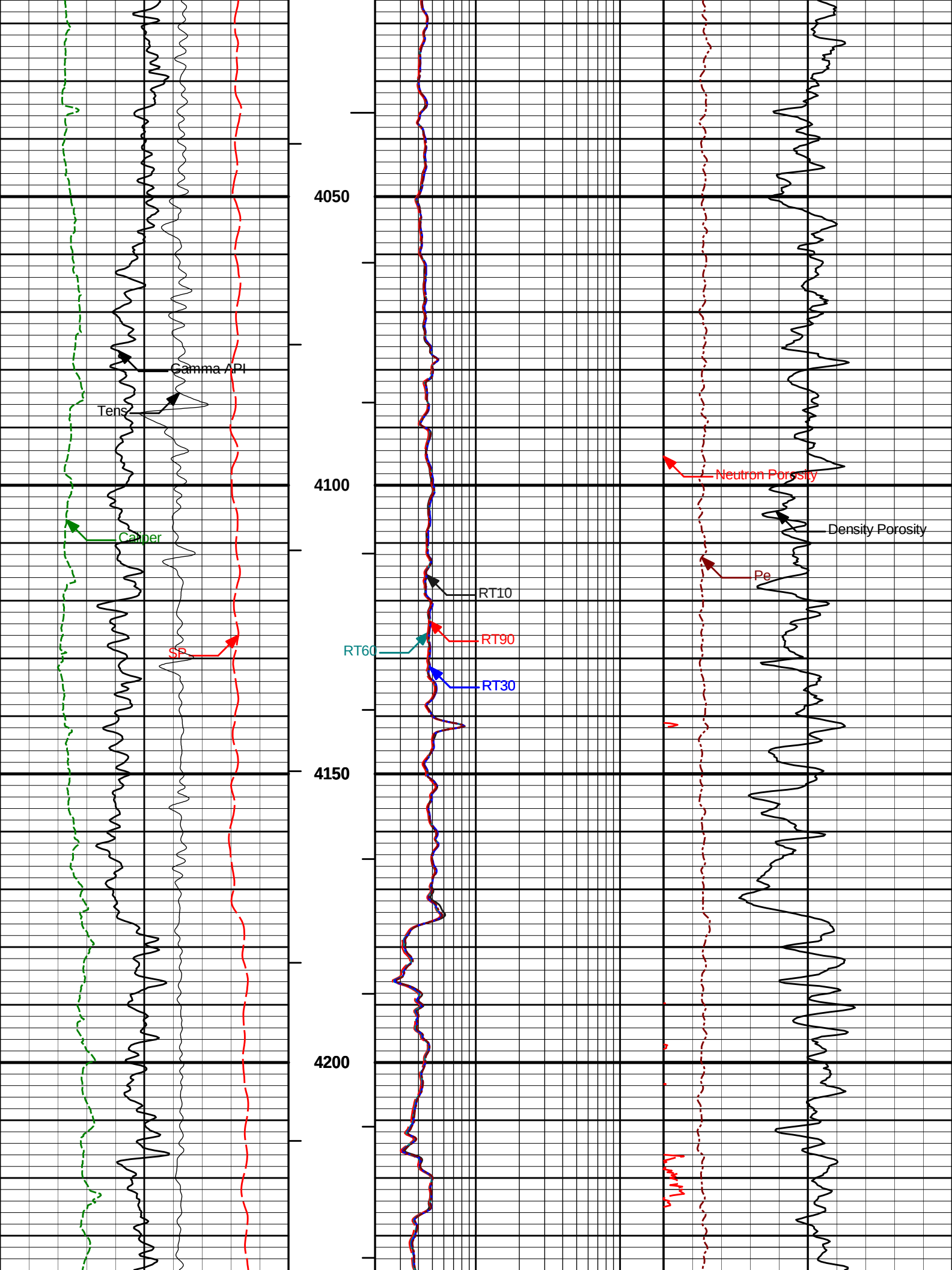
Tens
Caliper
SP
3600
3650
3700
3750
RT10
RT90
RT60
RT20
RT30
Neutron Porosity
Pe
Density Porosity


3800
3850
3900
3950
4000
2.68 SS MATRIX
Gamma API
Tens
Caliper
SP
RT10
RT90
RT60
RT30
RT20
Neutron Porosity
Density Porosity
Pe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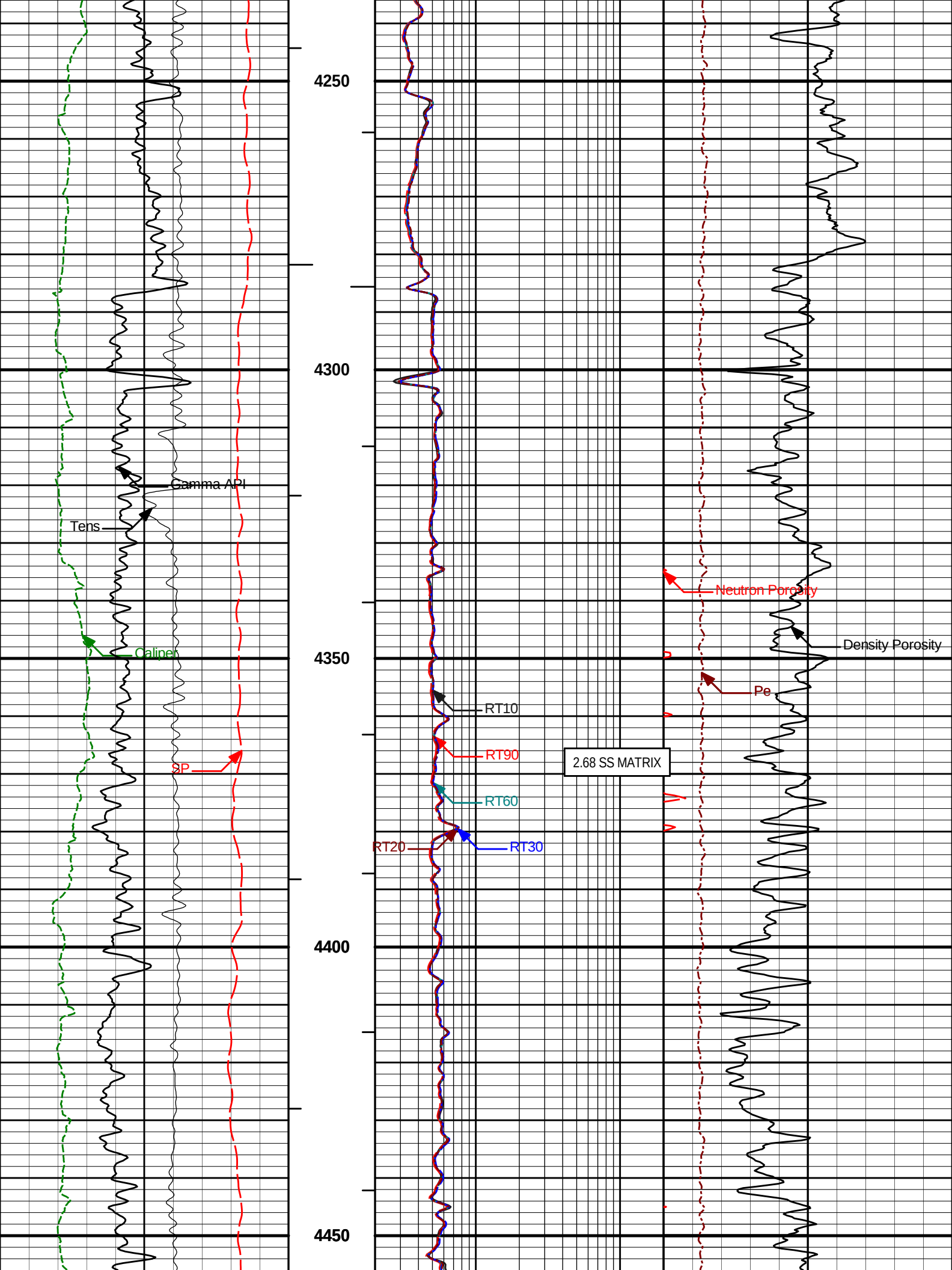
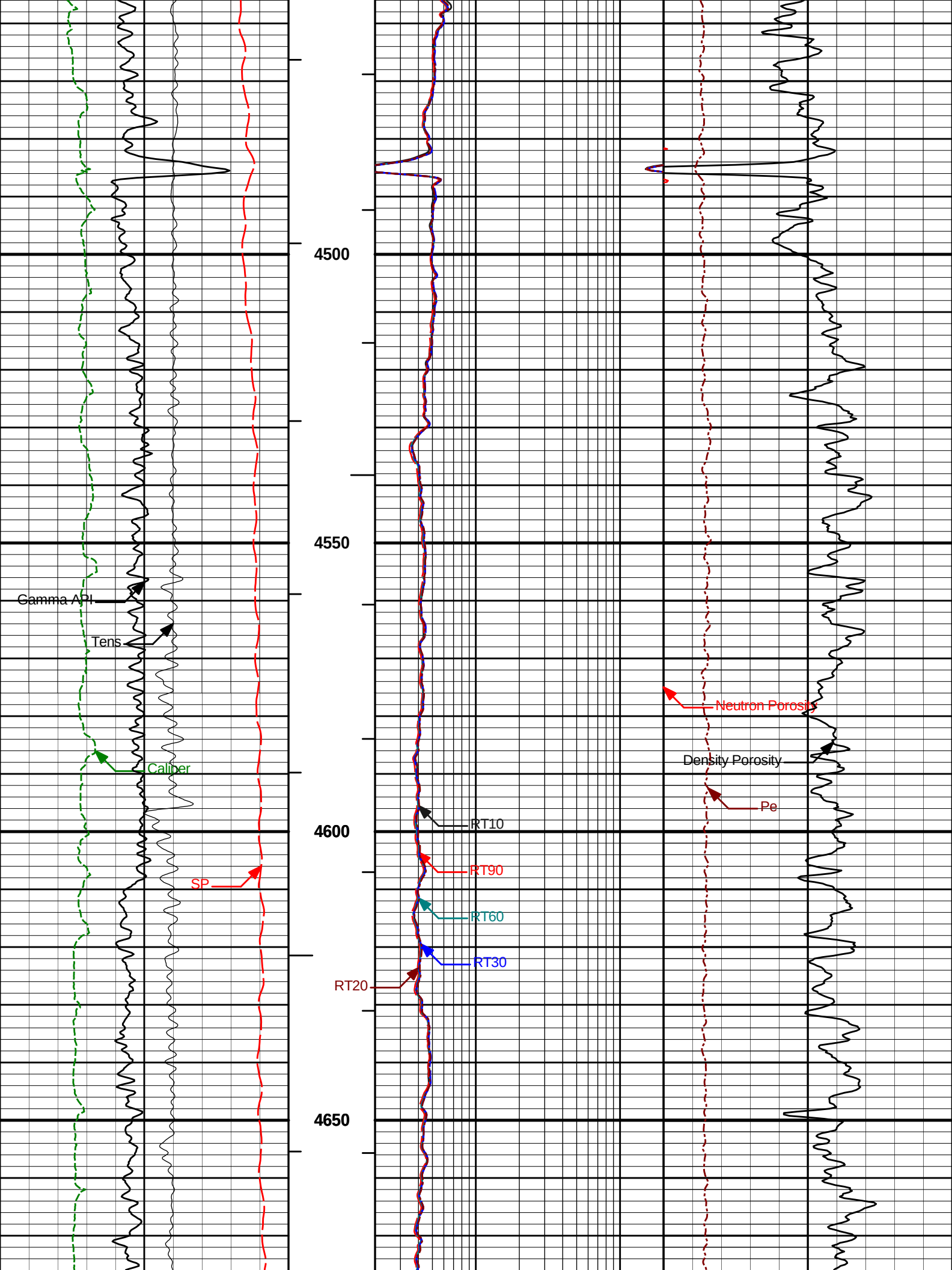
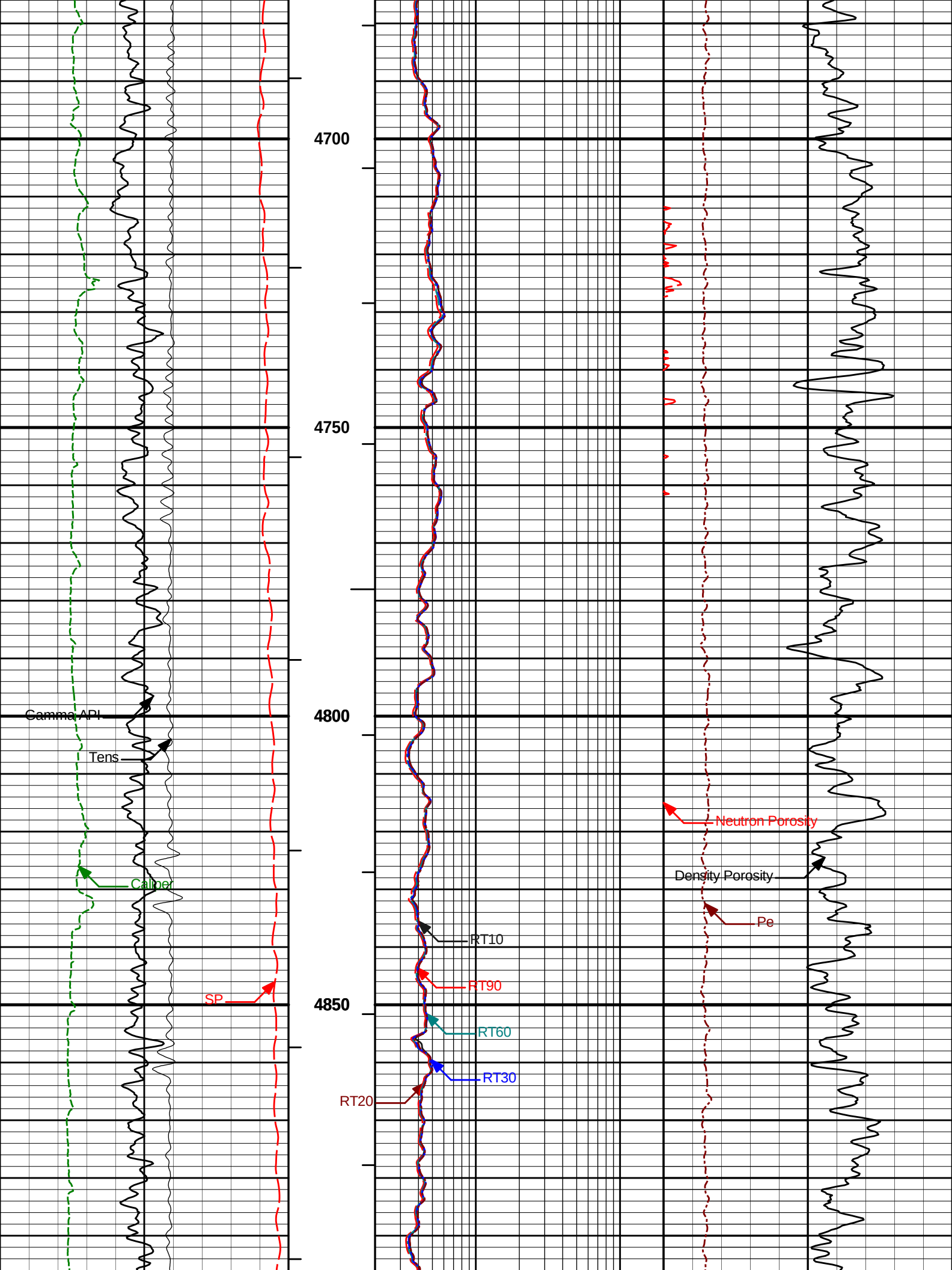
4100
4150
4200
Gamma API
Tens
Caliber
SP
RT10
RT60
RT90
RT30
Neutron Porosity
Density Porosity
Pe


4250
4300
4350
4400
4450
Gamma API
Tens
Caliper
SP
RT10
RT90
RT60
RT20
RT30
2.68 SS MATRIX
Neutron Porosity
Density Porosity
Pe


4500
4550
4600
4650
Gamma API
Tens
Caliber
SP
RT10
RT90
RT60
RT30
RT20
Neutron Porosity
Density Porosity
Pe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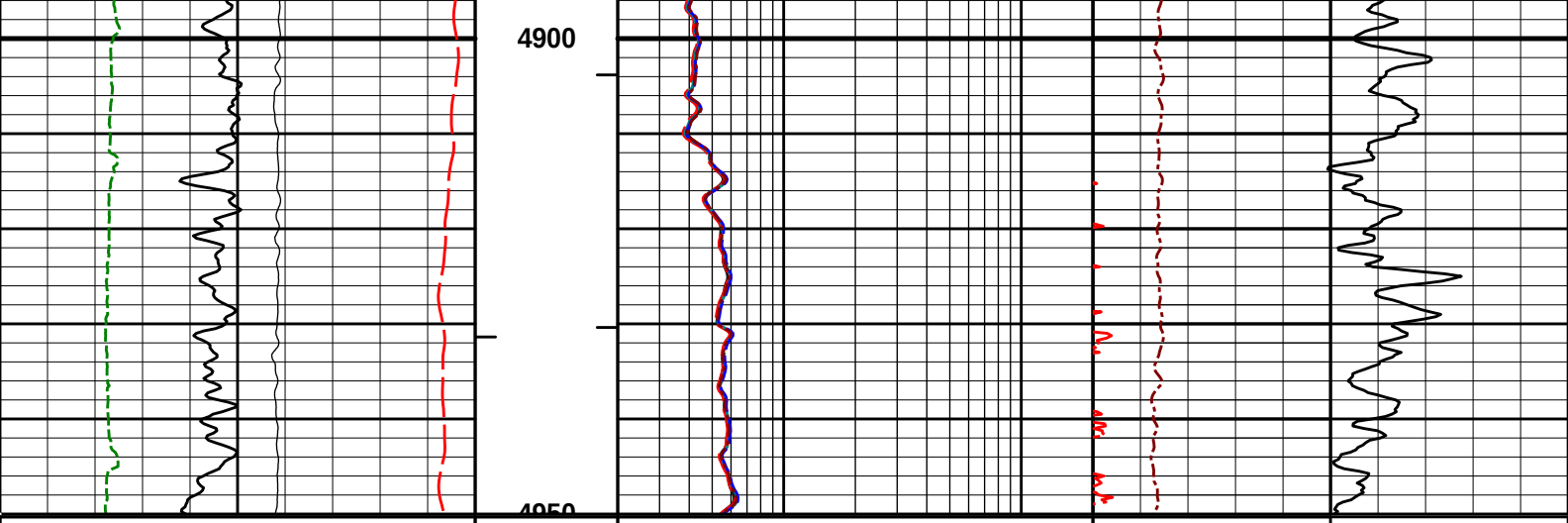
4750
4800
4850
Gamma API
Tens
Caliper
SP
RT10
RT90
RT60
RT30
RT20
Neutron Porosity
Density Porosity
Pe



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

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Plot Time: 08-Apr-11 01:36:32
Plot Range: 3400 ft to 4950 ft
Data: {ActiveWell}\Well Based\MAIN*
Plot File: \\COMP\MAIN

MAIN PASS 5" = 100'

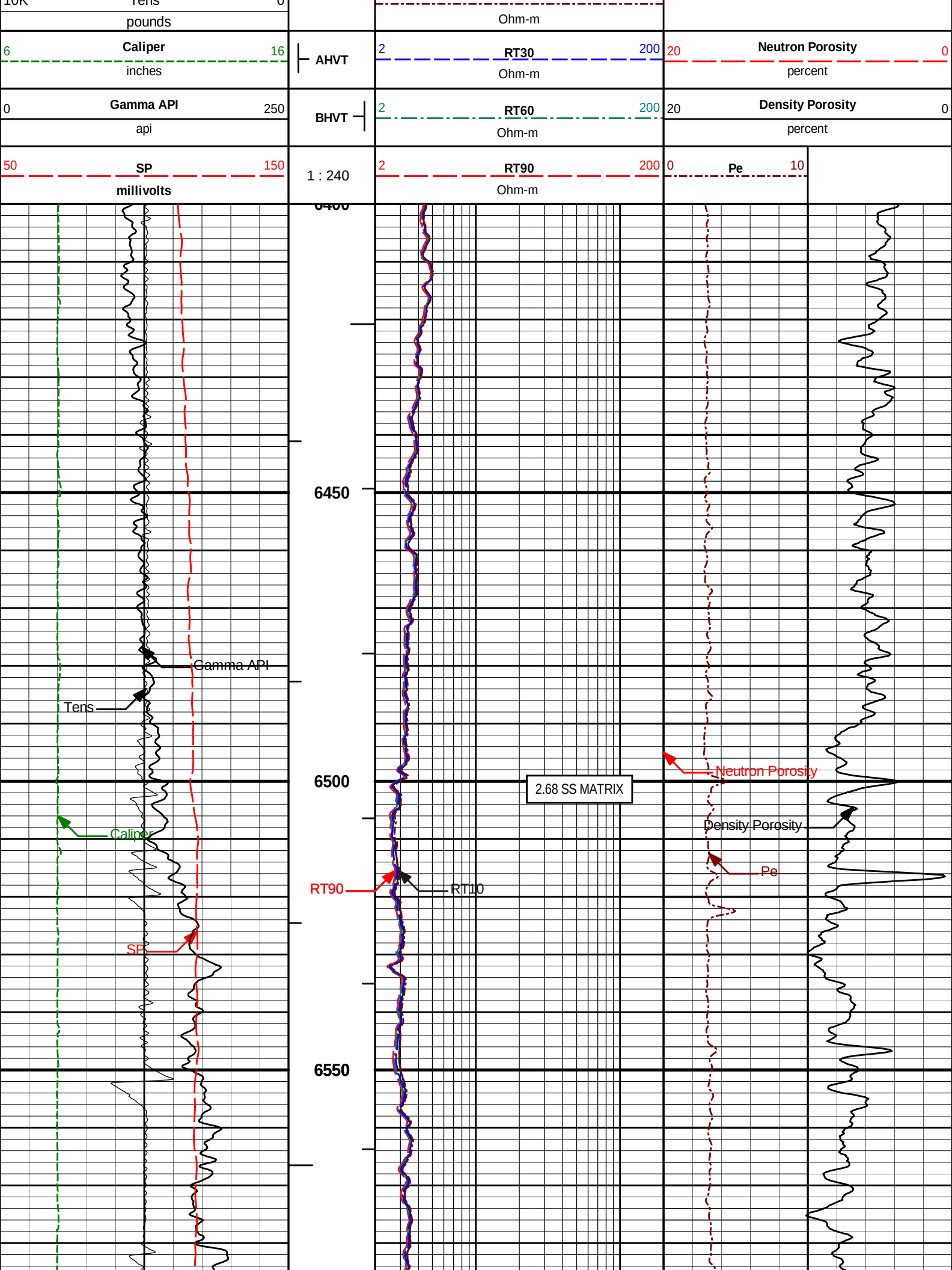
HALLIBURTON

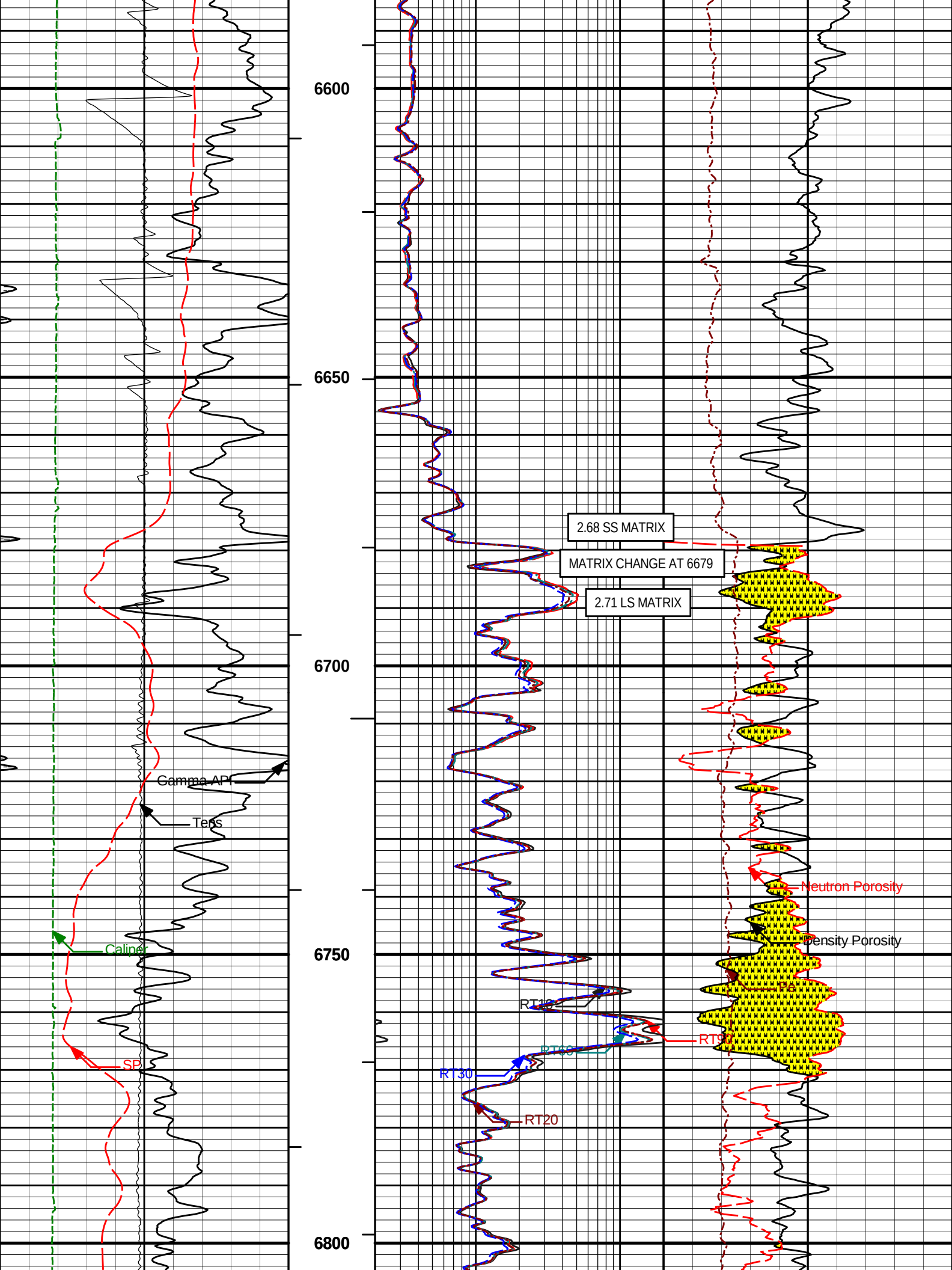
Plot Time: 08-Apr-11 01:36:33
Plot Range: 6400 ft to 7010.25 ft
Data: {ActiveWell}\Well Based\MAIN*
Plot File: \\COMP\REPEAT

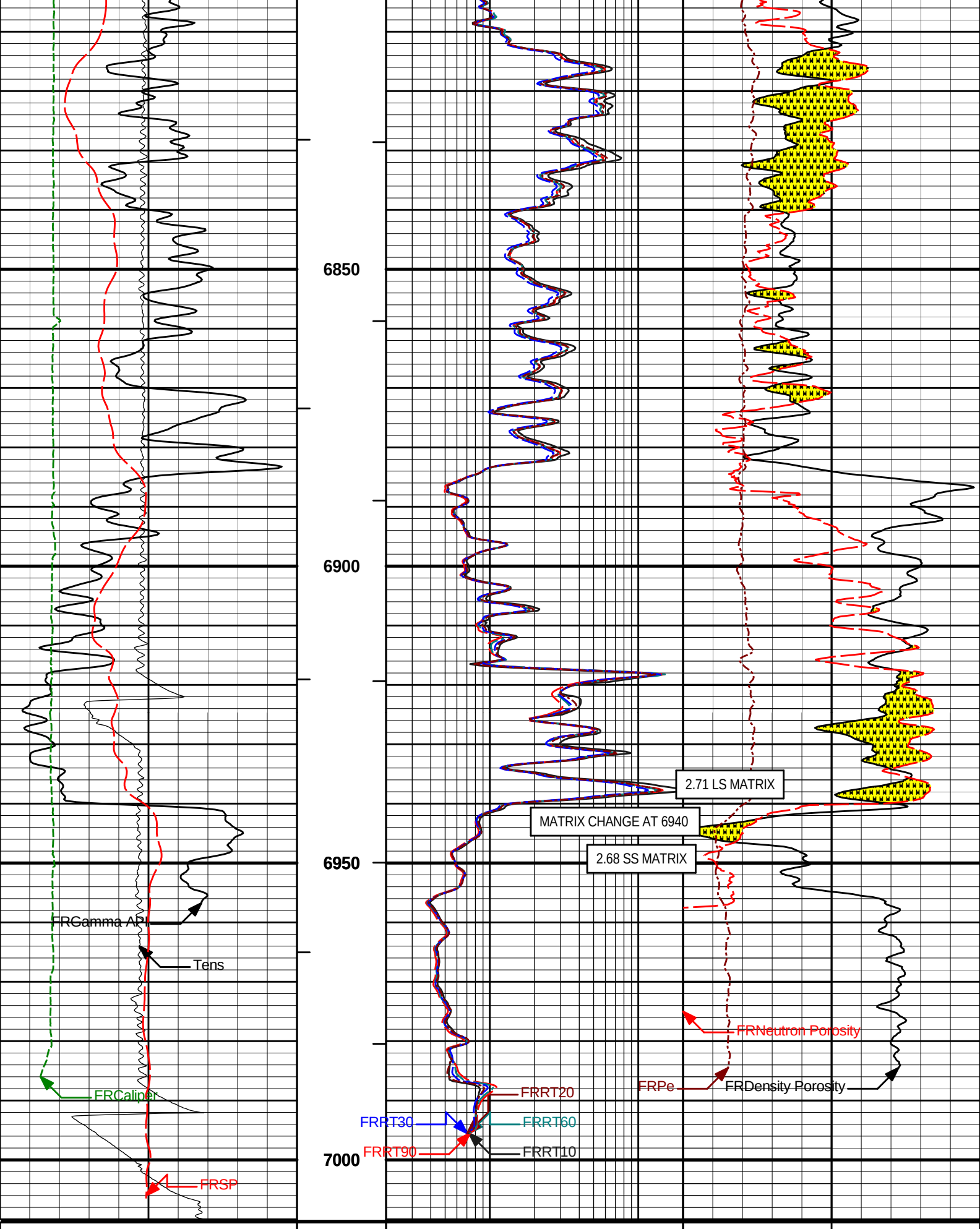
REPEAT SECTION 5" = 100'

Track 1	Depth Track	Track 2	Track 5	Track 3

		2 **RT10** 200 Ohm-m		
10K Tens 0		2 **RT20** 200		


10K
Tens
0
pounds
Caliper
6
16
inches
Gamma API
0
250
api
SP
50
150
millivolts
AHVT
BHVT
1 : 240
Ohm-m
RT30
2
200
RT60
RT90
Neutron Porosity
20
0
percent
Density Porosity
Pe
10
6450
6500
6550
Gamma API
Tens
Caliper
SP
RT90
RT10
2.68 SS MATRIX
Neutron Porosity
Density Porosity
Pe


6600
6650
6700
6750
6800
2.68 SS MATRIX
MATRIX CHANGE AT 6679
2.71 LS MATRIX
Gamma API
Tens
Caliper
SP
Neutron Porosity
Density Porosity
RT10
RT90
RT60
RT30
RT20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6900
6950
7000
2.71 LS MATRIX
MATRIX CHANGE AT 6940
2.68 SS MATRIX
FRCamma API
Tens
FRCaliper
FRSP
FRRT20
FRRT30
FRRT60
FRRT90
FRRT10
FRNeutron Porosity
FRPe
FRDensity Porosity
50
SP
150
millivolts
1 : 240
2
RT90
200
Ohm-m
0
Pe
10
0
Gamma API
250
2
RT60
200
20
Density Porosity
0

			BHVT		Ohm-m	percent
6	Caliper	16	AHVT	2	RT30 200	20 Neutron Porosity 0
	inches				Ohm-m	percent
10K	Tens	0		2	RT20 200	
	pounds				Ohm-m	
				2	RT10 200	
					Ohm-m	

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Plot Time: 08-Apr-11 01:36:35
Plot Range: 6400 ft to 7010.25 ft
Data: {ActiveWell}\Well Based\MAIN*
Plot File: \\COMP\REPEAT

REPEAT SECTION 5" = 100'

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:	**GTET - 11294346_RED**	**Reference Calibration Date:**	**24-Jan-11 09:38:13**
Engineer:	**C. GULLETT**	**Calibration Date:**	**10-Mar-11 16:03:18**
Software Version:	**WL INSITE R3.2.3 (Build 5)**	**Calibration Version:**	**1**

Calibrator Source S/N: TB 289
Calibrator API Reference:264.00 api
Equivalent Calibrator API Reference:268.6 api

Measurement	Measured	Calibrated	Units
Background	76.8	80.0	api
Background + Calibrator	334.6	348.6	api
Calibrator	271.9	268.6	api

CSNG-FS SHOP CALIBRATION

Tool Name:	**CSNG - 11568970**	**Reference Calibration Date:**	**05-Mar-11 15:47:38**
Engineer:	**C. GULLETT**	**Calibration Date:**	**07-Apr-11 14:04:16**
Software Version:	**WL INSITE R3.2.3 (Build 5)**	**Calibration Version:**	**1**
Source SN:	**KW-290**		

TITANIUM CASE	Measured	Calibrated	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	23.6	23.6	Channel #
583 KEV Peak Channel #	53.4	53.3	Channel #
2614 KEV Peak Channel #	220.7	220.2	Channel #
Calibrate Temperature	63.1	70.1	degF

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

2614 KEV Peak	Passed

Blanket Reference Value: 230.00 API
Calibrator Value: 261.2 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1570.5	CPS	325.2	324.9	API
Background	308.0	CPS	64.0	63.7	API

Gamma Ray Gain: 1.04
Expected Gain Range: 0.85 - 1.15
Gamma Gain Check: Passed

CSNG-FS FIELD CALIBRATION

Tool Name:	**CSNG - 11568970**	**Reference Calibration Date:**	**07-Apr-11 14:04:16**
Engineer:	**C. GULLETT**	**Calibration Date:**	**07-Apr-11 14:18:54**
Software Version:	**WL INSITE R3.2.3 (Build 5)**	**Calibration Version:**	**1**
Source SN:			

TITANIUM CASE	Shop	Field	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	23.6	23.6	Channel #
583 KEV Peak Channel #	53.3	53.3	Channel #
2614 KEV Peak Channel #	220.2	220.5	Channel #
Calibrate Temperature	70.1	73.6	degF

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

Blanket Reference Value: 230.00 API
Calibrator Value: 261.2 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1571.4	CPS	324.9	324.4	API
Background	306.1	CPS	63.7	63.2	API

Gamma Ray Gain: 1.04
Expected Gain Range: 0.85 - 1.15
Gamma Gain Check: Passed

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	**DSNT - PROT01**	**Reference Calibration Date:**	**01-Jan-70 00:00:00**
Engineer:	**F. LODER**	**Calibration Date:**	**18-Mar-11 16:18:56**
Software Version:	**WL INSITE R3.2.3 (Build 5)**	**Calibration Version:**	**1**

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

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.967	0.967	0.900 - 1.100

WATER TANK SUMMARY (Horizontal Water Tank)				
Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change
Porosity (decp):	0.2223	0.2223	0.0000	+/- 0.0020
Calibrated Ratio:	10.11	10.11	0.000	+/- 0.050

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

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

DUAL SPACED NEUTRON FIELD CALIBRATION

Tool Name: DSNT - PROT01 **Reference Calibration Date:** 18-Mar-11 16:18:56

Engineer: C. GULLETT **Calibration Date:** 07-Apr-11 13:30:49

Software Version: WL INSITE R3.2.3 (Build 5) **Calibration Version:** 1

Logging Source S/N: DSN-434

Snow Block S/N: BRIGHTON

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0723	0.0831	0.0108	+/- 0.0150

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

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name: SDLT - M335_P470_BLACK **Reference Calibration Date:** 10-Mar-11 09:54:56

Engineer: C. GULLETT **Calibration Date:** 07-Apr-11 09:56:54

Software Version: WL INSITE R3.2.3 (Build 5) **Calibration Version:** 1

Logging Source S/N: 2770GW

Aluminum Block S/N: BRIGHTON_AL Density: 2.600g/cc Pe: 3.100

Magnesium Block S/N: BRIGHTON_MG Density: 1.680g/cc Pe: 2.594

DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0481	1.0482	0.90 - 1.10
Near Dens Gain	1.0134	1.0296	0.90 - 1.10
Near Peak Gain	0.9948	1.0113	0.90 - 1.10
Near Lith Gain	0.9678	0.9992	0.90 - 1.10
Far Bar Gain	1.0174	1.0178	0.90 - 1.10
Far Dens Gain	1.0052	1.0058	0.90 - 1.10

Far Peak Gain	0.9979	0.9995	0.90 - 1.10
Far Lith Gain	0.9703	0.9796	0.90 - 1.10
Near Bar Offset	-0.1891	-0.1921	NONE
Near Dens Offset	0.1509	0.0104	NONE
Near Peak Offset	0.3039	0.1676	NONE
Near Lith Offset	0.4970	0.2442	NONE
Far Bar Offset	0.0528	0.0405	NONE
Far Dens Offset	0.1427	0.1298	NONE
Far Peak Offset	0.1848	0.1688	NONE
Far Lith Offset	0.3640	0.2915	NONE
Near Bar Background	1070.52	1064.75	700 - 1450
Near Dens Background	351.54	350.16	230 - 480
Near Peak Background	152.32	152.22	100 - 210
Near Lith Background	186.41	184.66	125 - 260
Far Bar Background	557.45	555.30	450 - 900
Far Dens Background	218.63	218.57	175 - 345
Far Peak Background	85.74	84.65	70 - 140
Far Lith Background	88.98	89.54	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.675	1.680	0.005	+/- 0.015
Pe	2.620	2.551	-0.069	+/- 0.150
ALUMINUM				
Density (g/cc)	2.596	2.600	0.004	+/- 0.01500
Pe	3.083	3.059	-0.024	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0013	+/- 0.0110	0.0004	+/- 0.0140
Magnesium Block	-0.0004	+/- 0.0110	-0.0008	+/- 0.0140
Aluminum Block	-0.0009	+/- 0.0110	-0.0004	+/- 0.0140
Resolution	9.12	6.00 - 11.50	9.55	6.00 - 11.50
Internal Verifier(B+D+P+L)	1752	1200 - 2700	948	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 - M335_P470_BLACK **Reference Calibration Date:** 07-Apr-11 09:56:54

Engineer:	**C. GULLETT**	**Calibration Date:**	**07-Apr-11 13:22:53**
Software Version:	**WL INSITE R3.2.3 (Build 5)**	**Calibration Version:**	**1**

Pad Temperature: 64.7 degF

DENSITY FIELD CALIBRATION SUMMARY

Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1751.787	1749.387	-2.400	16.784
Far (B+D+P+L) cps	948.060	950.844	2.784	16.612
Near Resolution	9.12	9.17	0.050	0.50
Far Resolution	9.55	9.64	0.090	1.00

PASS/FAIL SUMMARY

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

DENSITY CALIPER SHOP CALIBRATION

Tool Name:	**SDLT - M335_P470_BLACK**	**Reference Calibration Date:**	**10-Mar-11 11:10:13**
Engineer:	**C. GULLETT**	**Calibration Date:**	**07-Apr-11 13:19:01**
Software Version:	**WL INSITE R3.2.3 (Build 5)**	**Calibration Version:**	**1**

CALIBRATION COEFFICIENTS

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-1681.11	-2043.18	-7000.00 - -1000.00
Pad Gain	0.0003847	0.0004037	0.000200 - 0.000600
Arm Offset	-2950.39	-2756.65	-5000.00 - 3000.00
Arm Gain	0.0005769	0.0005924	0.000300 - 0.000700
Arm Power	-0.000006589	-0.000007443	-0.000010 - 0.000010

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

Tool Diameter: 4.50 in

CALIBRATION RINGS

Measurement	Current Reading (Previous Coeff.)	Calibrated (New Coeff.)	Change	Control Limit On New Value
PAD EXTENSION:				
Small Ring (in)	2.05	2.00	-0.05	+/- 0.20
Medium Ring (in)	3.71	3.75	0.04	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.49	6.50	0.01	+/- 0.20
Medium Ring (in)	8.21	8.25	0.04	+/- 0.20
Large Ring (in)	15.01	15.00	-0.01	+/- 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:**	**07-Apr-11 13:19:01**
Engineer:	**C. GULLETT**	**Calibration Date:**	**07-Apr-11 13:25:04**
Software Version:	**WL INSITE R3.2.3 (Build 5)**	**Calibration Version:**	**1**

MEASURED CALIPER VALUES

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.77	0.02	+/- 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 - E2817-S4353_RED
Reference Calibration Date: 13-Aug-10 20:06:47
Engineer: F. LODER
Calibration Date: 30-Mar-11 18:36:19
Software Version: WL INSITE R3.2.3 (Build 5)
Calibration Version: 1

TYPICAL GAIN RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0059	1.05	0.95	1.0075	1.05	0.95	1.0051	1.05
A2 (50")	0.95	1.0076	1.05	0.95	1.0107	1.05	0.95	1.0110	1.05
A3 (29")	0.95	1.0065	1.05	0.95	1.0088	1.05	0.95	1.0066	1.05
A4 (17")	0.95	1.0010	1.05	0.95	1.0019	1.05	0.95	1.0026	1.05
A5 (10")	N/A	N/A	N/A	0.95	0.9944	1.05	0.95	0.9930	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9793	1.05	0.95	0.9785	1.05

TYPICAL SONDE OFFSET RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	-5	-1.036	2	-6	-4.390	-2	-8	-4.791	-2
A2 (50")	-7	-1.751	-1	-6	-2.896	-2	-7	-4.731	-2
A3 (29")	-27	-12.778	-9	-9	-3.452	-3	-7	-3.636	-1
A4 (17")	-180	-88.705	-60	-45	-28.593	-15	-39	-24.648	-13
A5 (10")	N/A	N/A	N/A	-150	-91.844	-50	-80	-44.230	-10
A6 (6")	N/A	N/A	N/A	175	331.191	525	90	166.676	270

TRANSMITTER CURRENT GAIN

Signal	Lower	R	Upper
12K	0.6	0.8814	1.3
36K	1.0	1.8411	2.0
72K	1.0	1.1239	2.0

R-MUD VERIFICATION

Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
Mud Cell	0.95	0.997	1.05

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11294346_RED						
Gamma Ray Calibrator	268.6	----------	----------	0.0	+/- 9.00	api
CSNG-11568970						
60 KEV Peak Channel #	48.0	48.0	----------	0.0	----------	Channel #
239 KEV Peak Channel #	23.6	23.6	----------	0.0	----------	Channel #
583 KEV Peak Channel #	53.3	53.3	----------	0.0	----------	Channel #
2614 KEV Peak Channel #	220.2	220.5	----------	-0.3	----------	Channel #
DSNT-PROT01						
Snow-Block Porosity	0.0723	0.0831	----------	-0.0108	+/- 0.0150	decp
SDLT-M335_P470_BLACK						

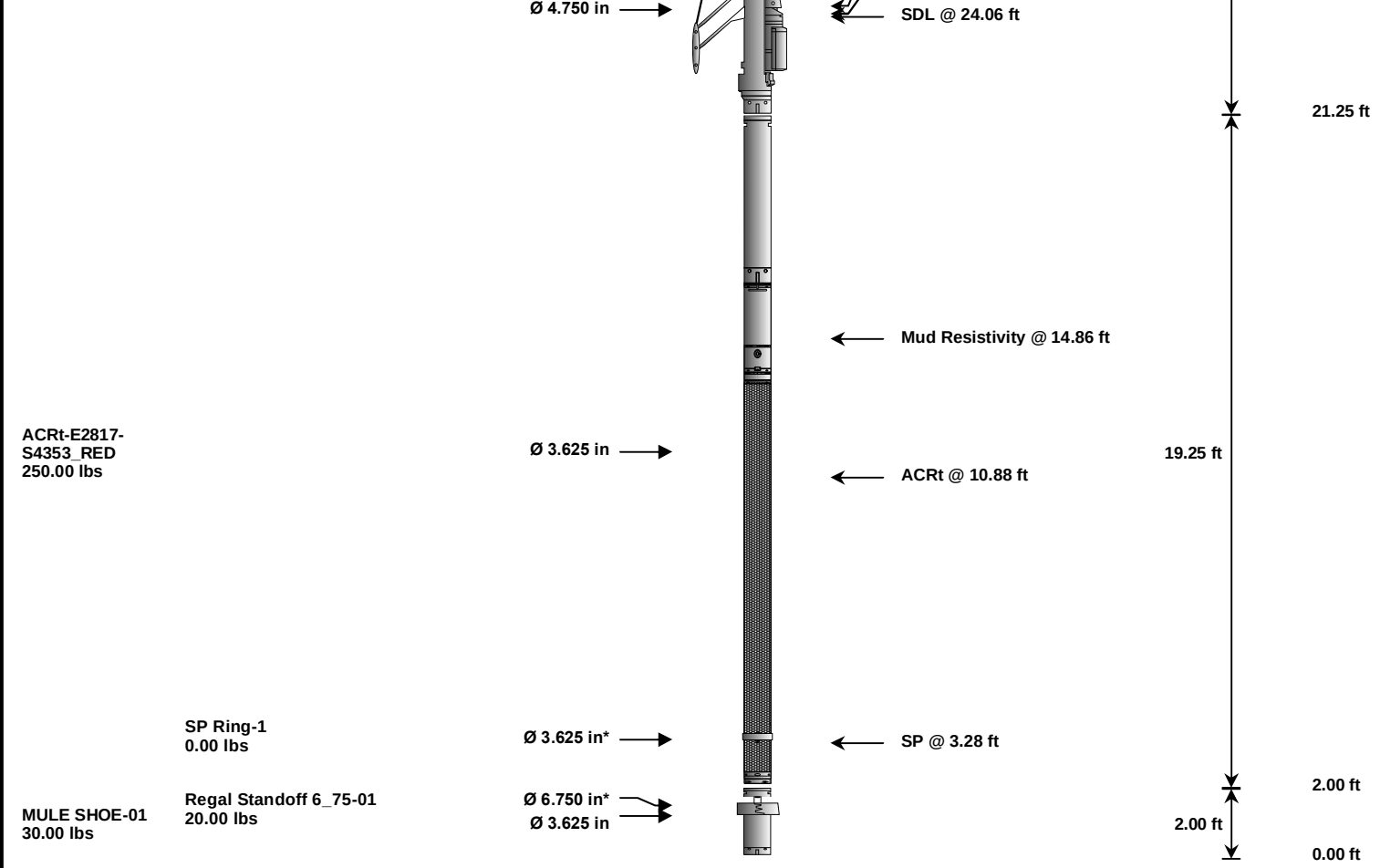
Near(B+D+P+L)	1751.787	1749.387	----------	2.400	+/-16.784	cps
Far(B+D+P+L)	948.060	950.844	----------	-2.784	+/-16.612	cps
Pad Extension	3.75	3.77	----------	-0.02	+/-0.10	in
Ring Diameter	8.25	8.25	----------	0.000	+/-0.15	in
ACRt-E2817-S4353_RED						
Mud Cell	0.997	----------	----------	0.000	----------	ohm-m

Data: CRICKET_C22_30D\0001 NOBLE_BLACK\IDLE **Date: 08-Apr-11 00:26:46**

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
						64.69 ft
RWCH-B097 135.00 lbs		Ø 3.625 in		Load Cell @ 61.00 ft BH Temperature @ 60.44 ft	6.25 ft	
						58.44 ft
GTET-11294346_RED 165.00 lbs		Ø 3.625 in		GammaRay @ 52.37 ft	8.52 ft	
						49.92 ft
CSNG-11568970 114.00 lbs		Ø 3.625 in		CSNG @ 44.29 ft	8.17 ft	
						41.75 ft
DSNT-PROT01 174.00 lbs	DSN Decentralizer-11277440 6.60 lbs	Ø 3.625 in* Ø 3.625 in		DSN Far @ 34.81 ft DSN Near @ 34.06 ft	9.69 ft	
						32.06 ft
SDLT-M335_P470_BLACK 360.00 lbs		Ø 4.500 in		SDL Microlog @ 24.25 ft SDL Caliper @ 24.07 ft	10.81 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		58.44	300.00
GTET	Gamma Telemetry Tool	11294346_RED	165.00	8.52		49.92	60.00
CSNG	Compensated Spectral Natural Gamma	11568970	114.00	8.17		41.75	15.00
DSNT	Dual Spaced Neutron	PROT01	174.00	9.69		32.06	60.00
DCNT	DSN Decentralizer	11277440	6.60	5.13	*	35.39	300.00
SDLT	Spectral Density Tool	M335_P470_BLACK	360.00	10.81		21.25	60.00
ACRt	Array Compensated True Resistivity	E2817-S4353_RED	250.00	19.25		2.00	300.00
SP	SP Ring	1	0.00	0.25	*	3.28	300.00
M S	MULE SHOE	01	30.00	2.00		0.00	100.00
RSOF	Regal Standoff 6.75in	01	20.00	0.52	*	1.18	300.00
Total			**1,254.60**	**64.69**			

* Not included in Total Length and Length Accumulation.

Data: CRICKET_C22_30D\0001 NOBLE_BLACK\IDLE **Date: 07-Apr-11 22:26:08**

COMPANY	**NOBLE ENERGY INC.**		
WELL	**CRICKET C22-30D**		
FIELD	**WATTENBERG**		
COUNTY	**WELD**	STATE	**CO**

HALLIBURTON

SPECTRAL DENSITY
DUAL SPACED NEUTRON
ARRAY COMPENSATED
TRUE RESISTIVITY