



Weatherford®

**COMPOSITE LOG
RESISTIVITY - POROSITY
INDUCTION - SPECTRAL GAMMA**

COMPANY				WHITTING OIL AND GAS CORPORATION			
WELL				RAZOR 250-2443			
FIELD				WILDCAT			
PROVINCE/COUNTY WELD				U.S.A. / COLORADO			
LOCATION				SW SE SEC:25, TWP:10N, RNG:58W, MERIDIAN			
SEC 25	TWP 10N	RGE 58W	Other Services				
Latitude		40.803322	CMI				
Longitude		-103.810303					
API Number		05-123-42634-00					
Permanent Datum GL, Elevation 4717.7 feet							
Log Measured From KB							
Drilling Measured From KB @ 21 FT							
Date	22-AUG-2016					Elevations:	feet
Run Number	ONE					KB	4738.70
Service Order	4052-15911415					DF	4738.70
Depth Driller	16040.00					GL	4717.70
Depth Logger	16040.00						
First Reading	16015.00						
Last Reading	2096.00						
Casing Driller	2096.00						
Casing Logger	2096.00						
Bit Size	8.500						
Hole Fluid Type	WBM						
Density / Viscosity	10.70 lb/USg						
PH / Fluid Loss	8.80						
Sample Source	FLOWLINE						
Rm @ Measured Temp	0.918 @103.8						
Rmf @ Measured Temp	0.734 @103.8						
Rmc @ Measured Temp	1.101 @103.8						
Source Rmf / Rmc	CALC						
Rm @ BHT	0.433 @103.8						
Time Since Circulation	0 HOURS						
Max Recorded Temp	225.00						
Equipment / Base	13045						
Recorded By	Z. ALSUDANI						
Witnessed By	KYLE RENTON						

BOREHOLE RECORD				Last Edited: 22-AUG-2016 14:42	
Bit Size inches		Depth From feet		Depth To feet	
8.500		2096.00		16040.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURF.	9.625	0.00	2096.00	36.00	

REMARKS
SOFTWARE VERSION USED:16.01.9040 TOOLS CONVEYED VIA DRILL PIPE/COMPACT WELL SHUTTLE
LOGS RECORDED USING A 200V MEMORY LOGGING SYSTEM 200V EXTENDED BATTERIES USED TO POWER TOOLSTRING
ALL DEPTHS RECORDED WITH WEATHERFORD ADVANTAGE DEPTH SYSTEM IN CONJUNCTION WITH RIG PASON EDR SYSTEM ALL DEPTHS CORRECTED TO DRILLER'S STRAP DEPTH
NO REPEAT LOG AVAILABLE WITH SHUTTLE LOGGING OPERATION
TIGHT PULLS, BOREHOLE SIZE, AND RUGOSITY MAY AFFECT DATA QUALITY
LOGGING UP CIRCULATING AND ROTATING DRILL PIPE AT 15 RPM FOR MORE THAN SIX STANDS FROM BOTTOM.
TOOLS: SRT-A , MLK 14.23 FT, MLK 14.23 FT, MLK 8.53 FT, MLK 4.47 FT, SHA-J, SKJ-E, MBS-G, MMS-F, MTI-C, MGS-C, MCL-C, MSG-A, MFE-C, SKJ-E,SHA-J, MIS-D, MDN-C, MPD-C, MVC-A, SHA-J, SKJ-E, MIS-E, SKJ-E,MIS-D, MIM-D,MIE-E,MIS-D,MAI-B. RAN IN COMBINATION

MAIN COMBINATION.

HARDWARE USED: MAI - INDUCTION INLINE CENTRALIZER ASSEMBLY AT THE BOTTOM OF THE TOOL.
MIE - INLINE CENTRALIZER AT THE BOTTOM AND A CENTRALIZER ON THE TOOL ABOVE THE CALIPERS.
MIM - INLINE CENTRALIZER ABOVE THE TOOL.
SKJ-MISE-SKJ : KNUCKLE - STANDOFF - KNUCKLE FOR SMOOTH TRANSITION TO THE CENTRALIZED

SECTION.

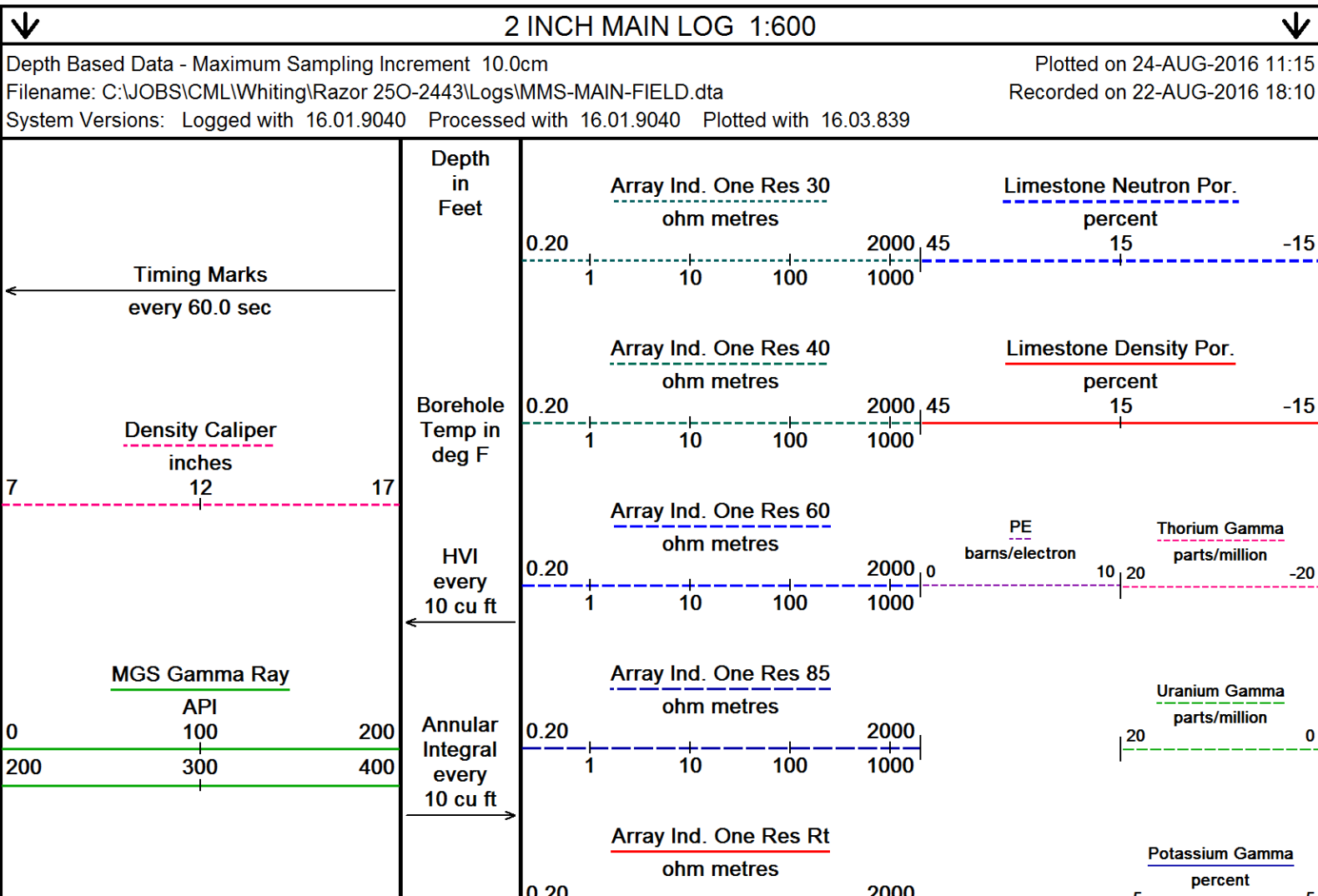
MPD - 4 INCH PROFILE PLATE.
MDN - DUAL BOWSTRINGS DECENTRALIZER ON TOP OF THE TOOL.

5.5 INCH PRODUCTION CASING SIZE USED TO CALCULATE ANNULAR HOLE VOLUME
ANNULAR HOLE VOLUME FROM T.D. TO SURFACE CASING : 4186 CUBIC FEET
HOLE VOLUME FROM T.D. TO SURFACE CASING: 6474 CUBIC FEET

CHLORIDE: 1600 mg/l

CREW:D. SMITH, M.DEBBAN.
RIG: UNIT BOSS 406.

In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.



Bit Size
inches
12

7 17

Replay
Scale
1:600

0.20 1 10 100 2000

Density Correction
grams/cc
-0.25 0.25

300

108°

400

109°

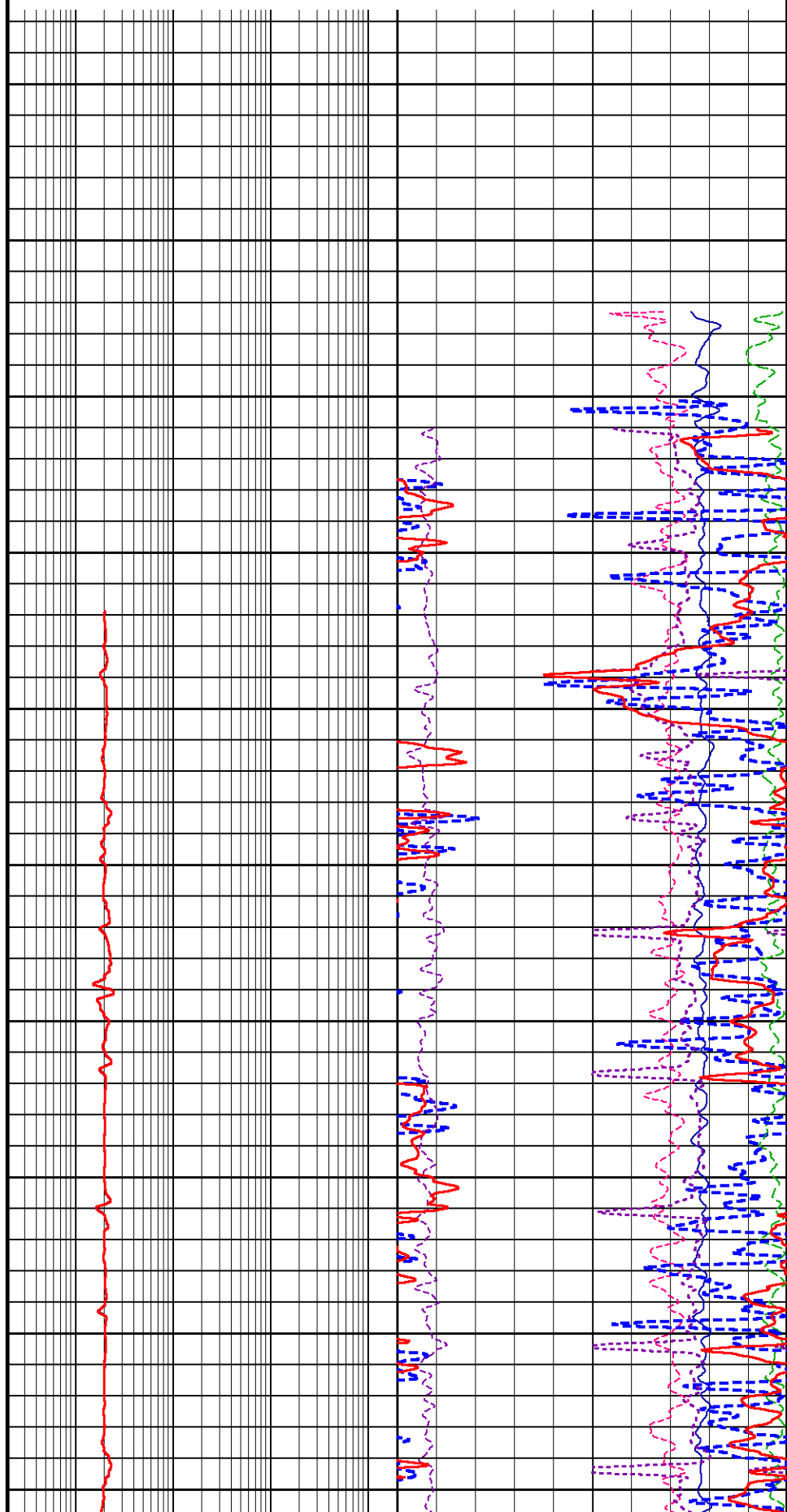
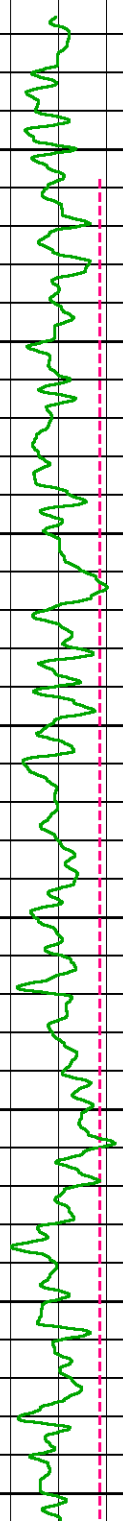
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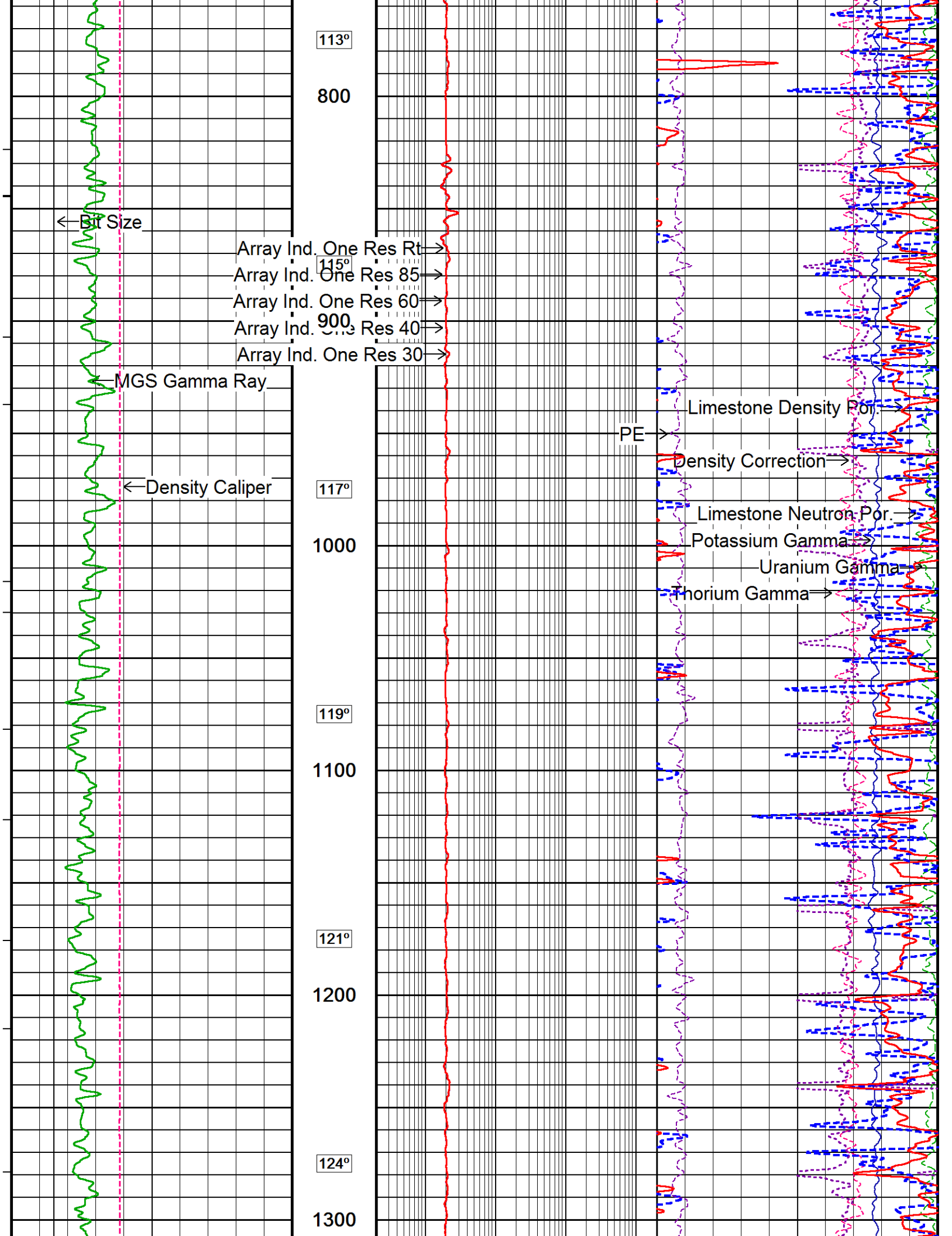
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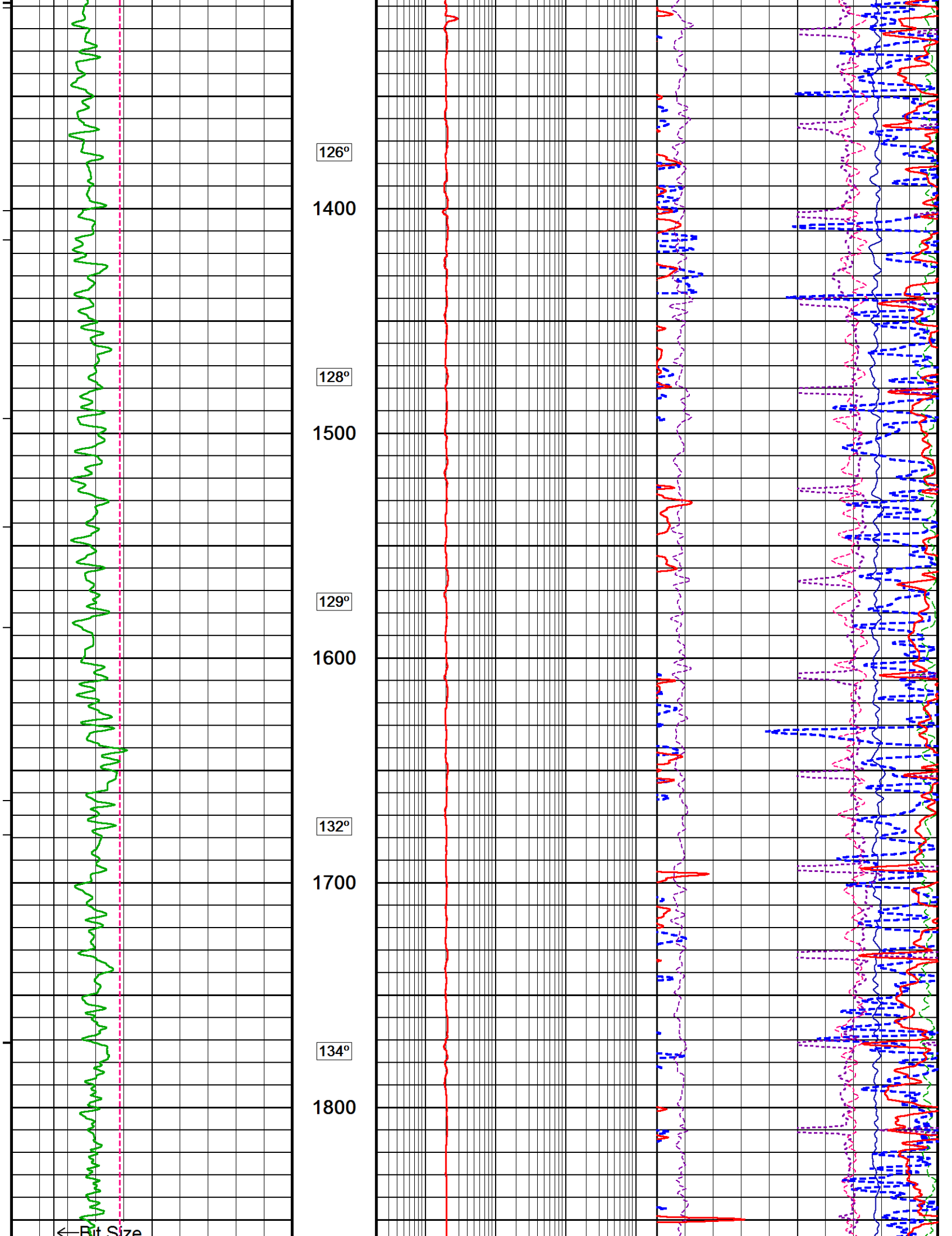
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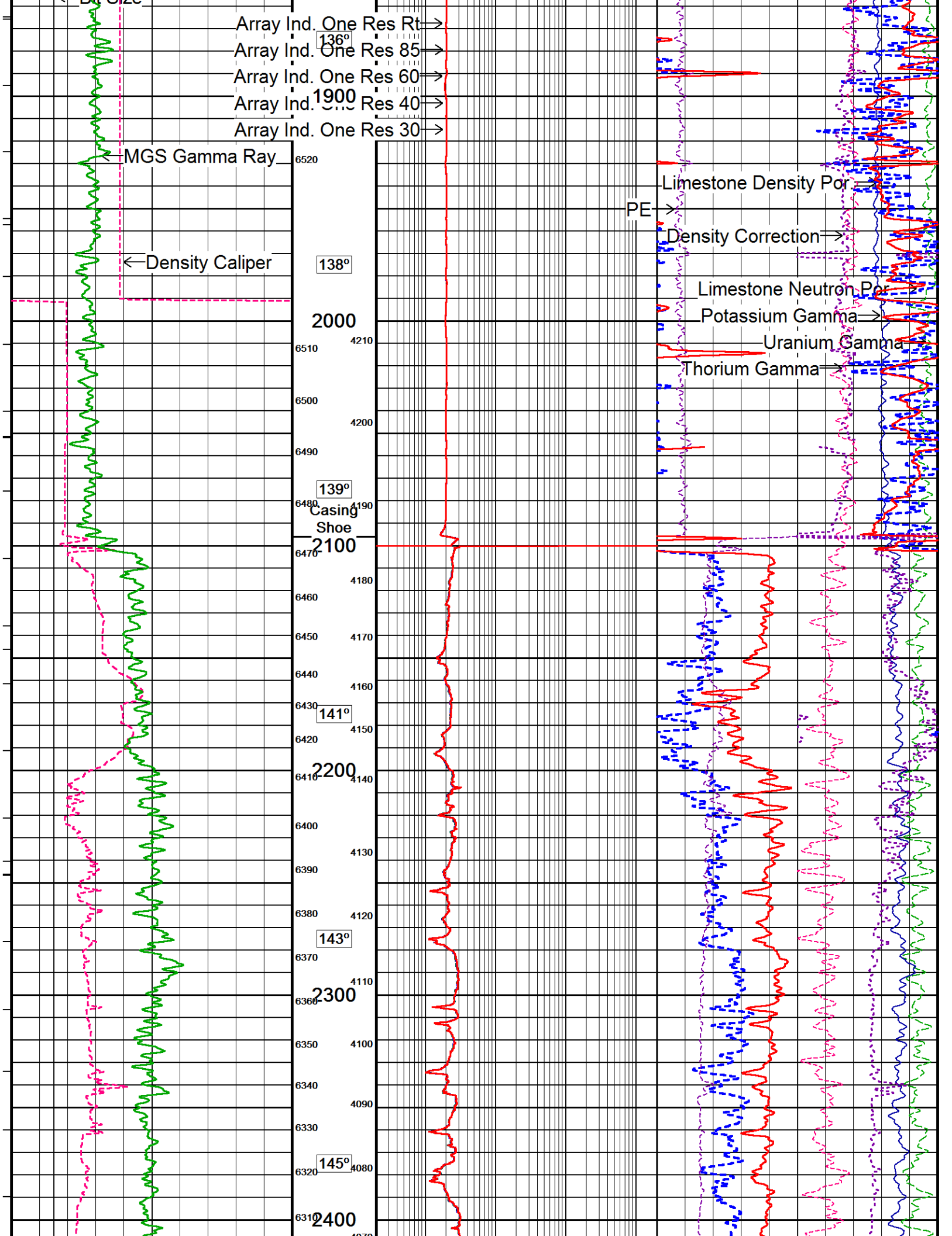
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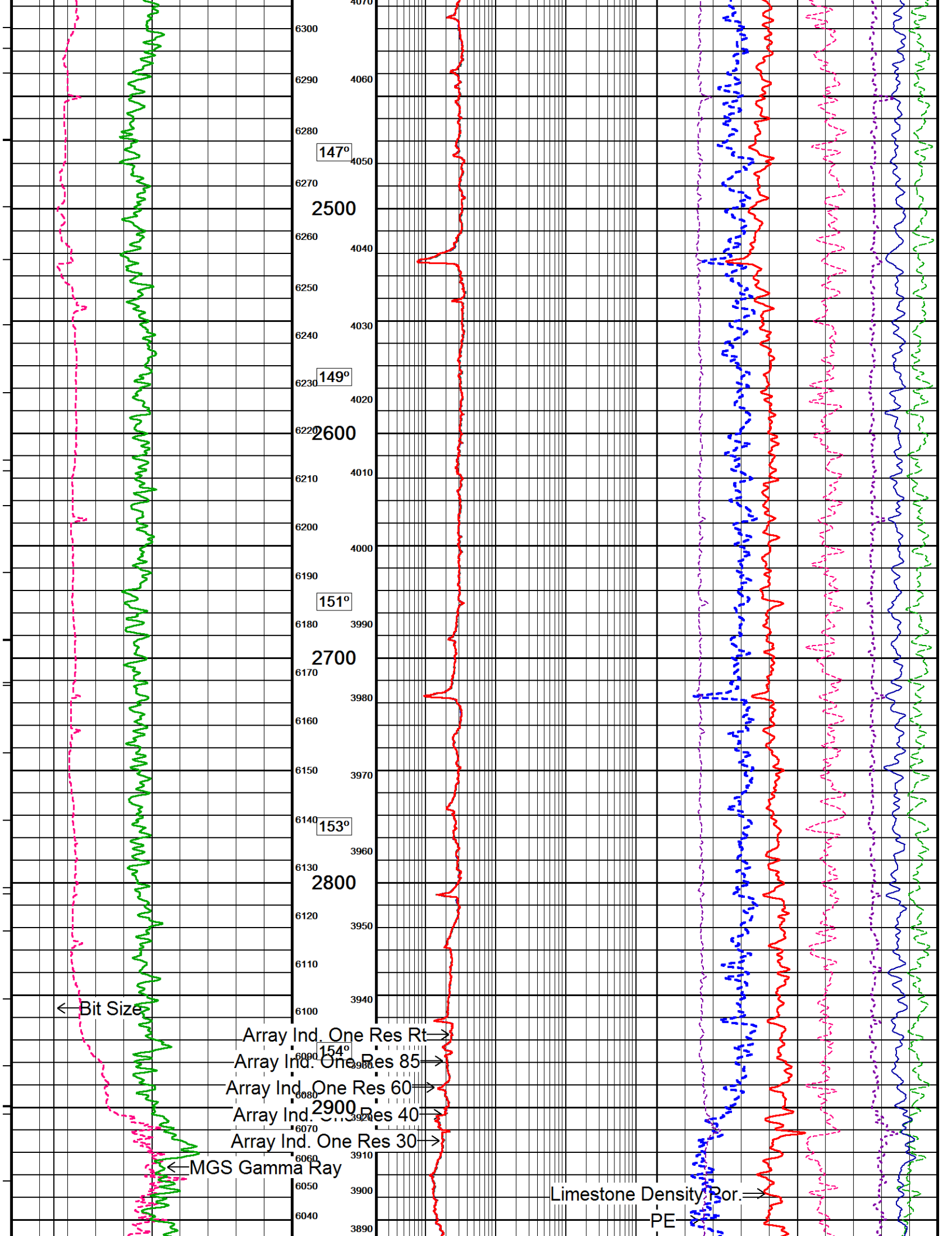
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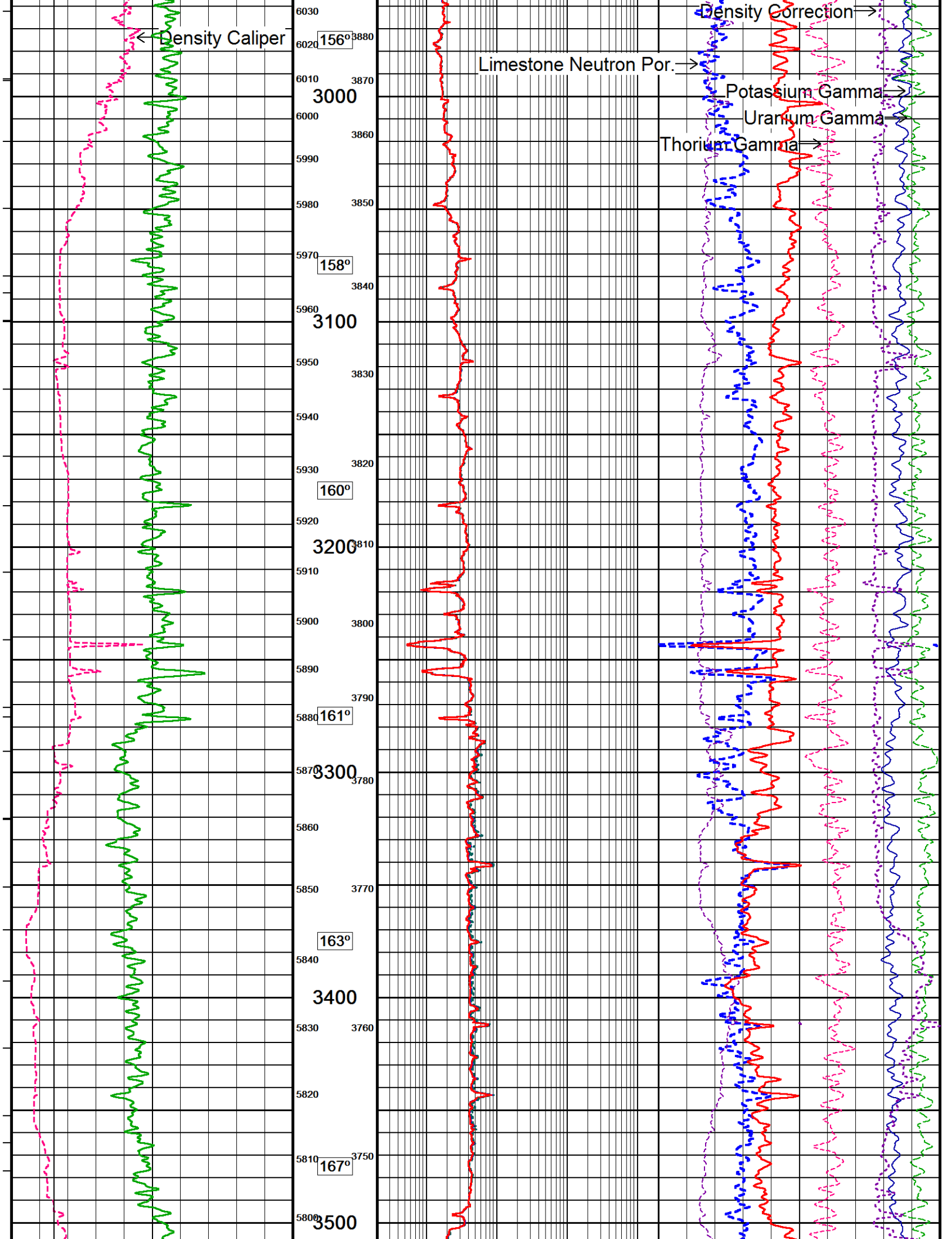


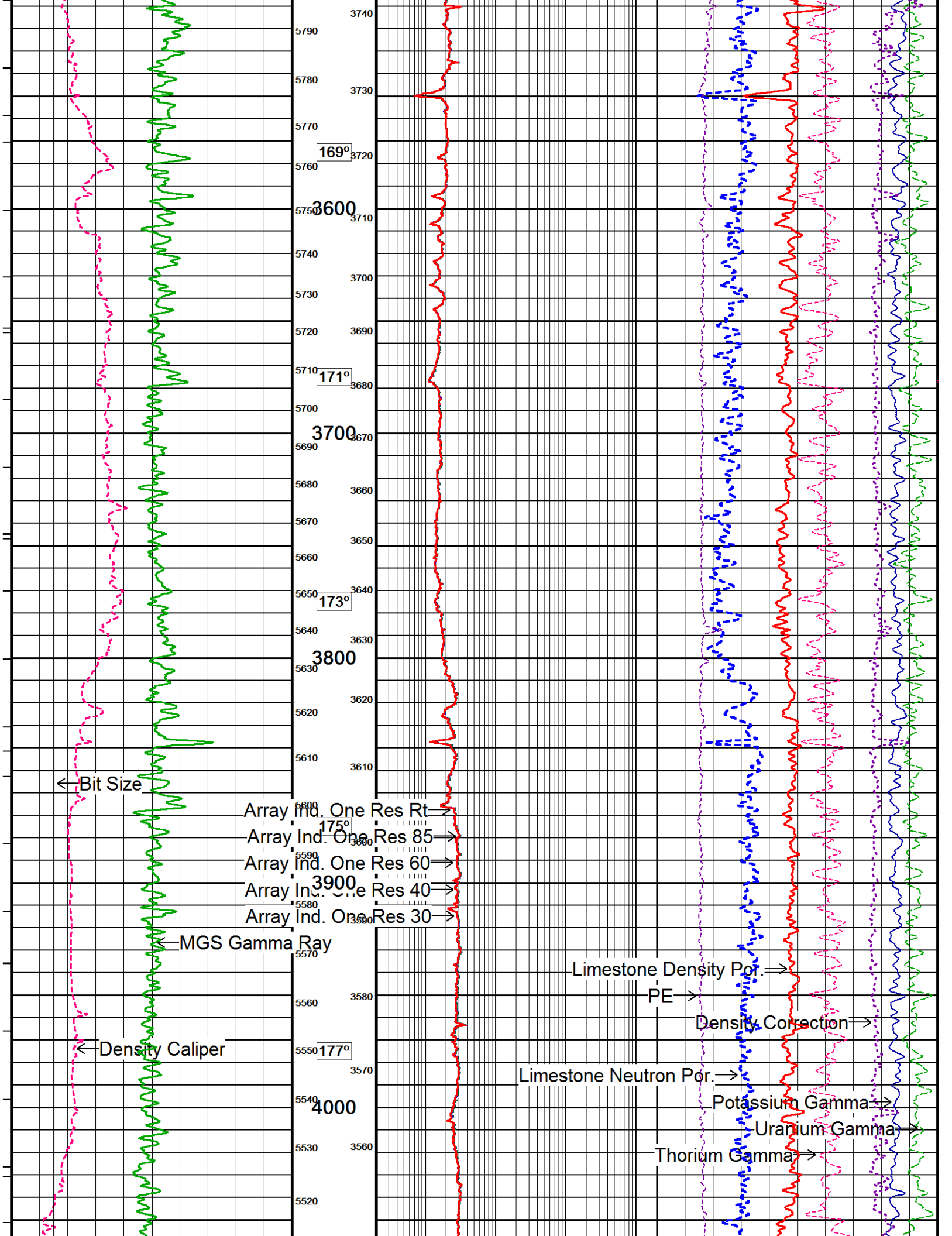


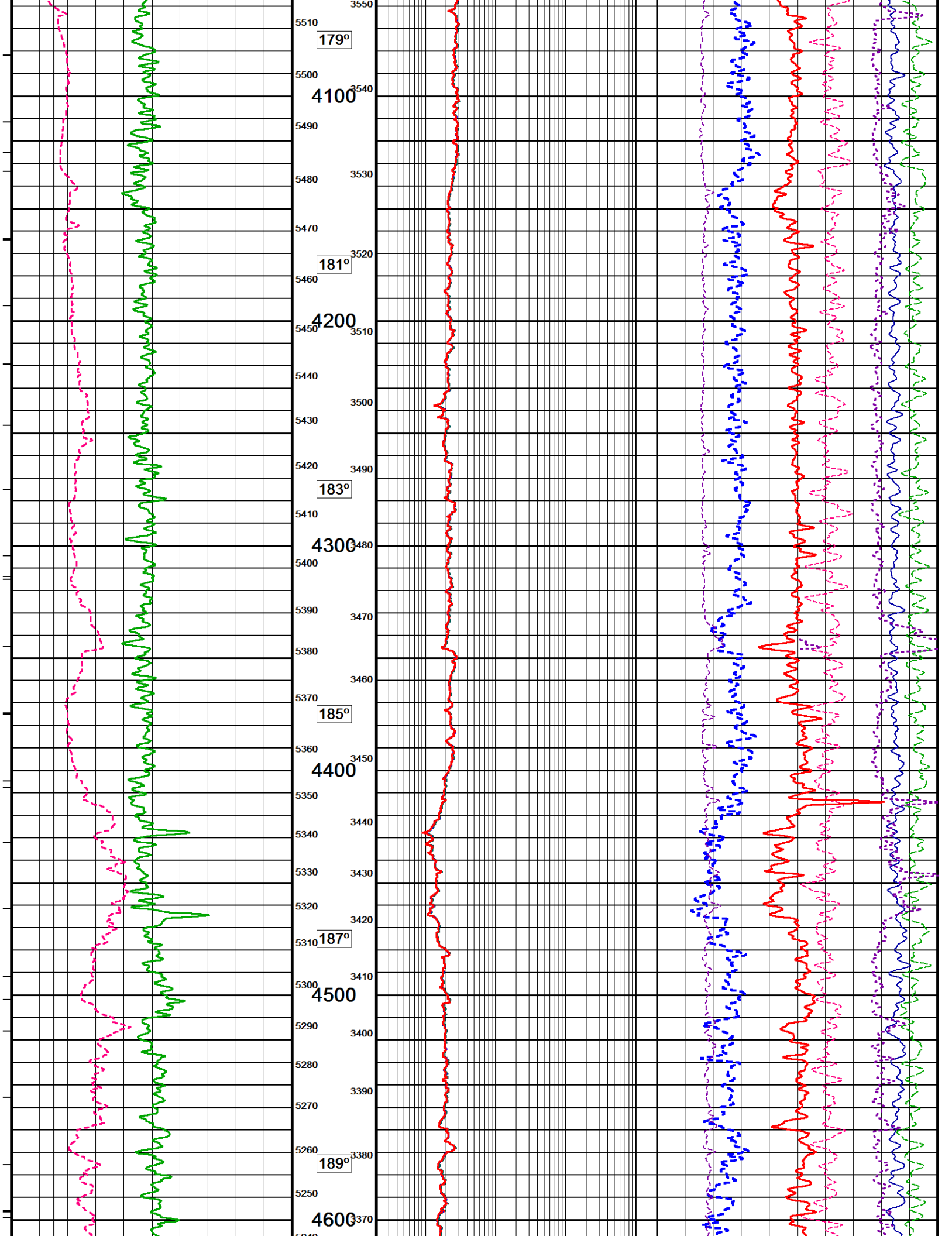


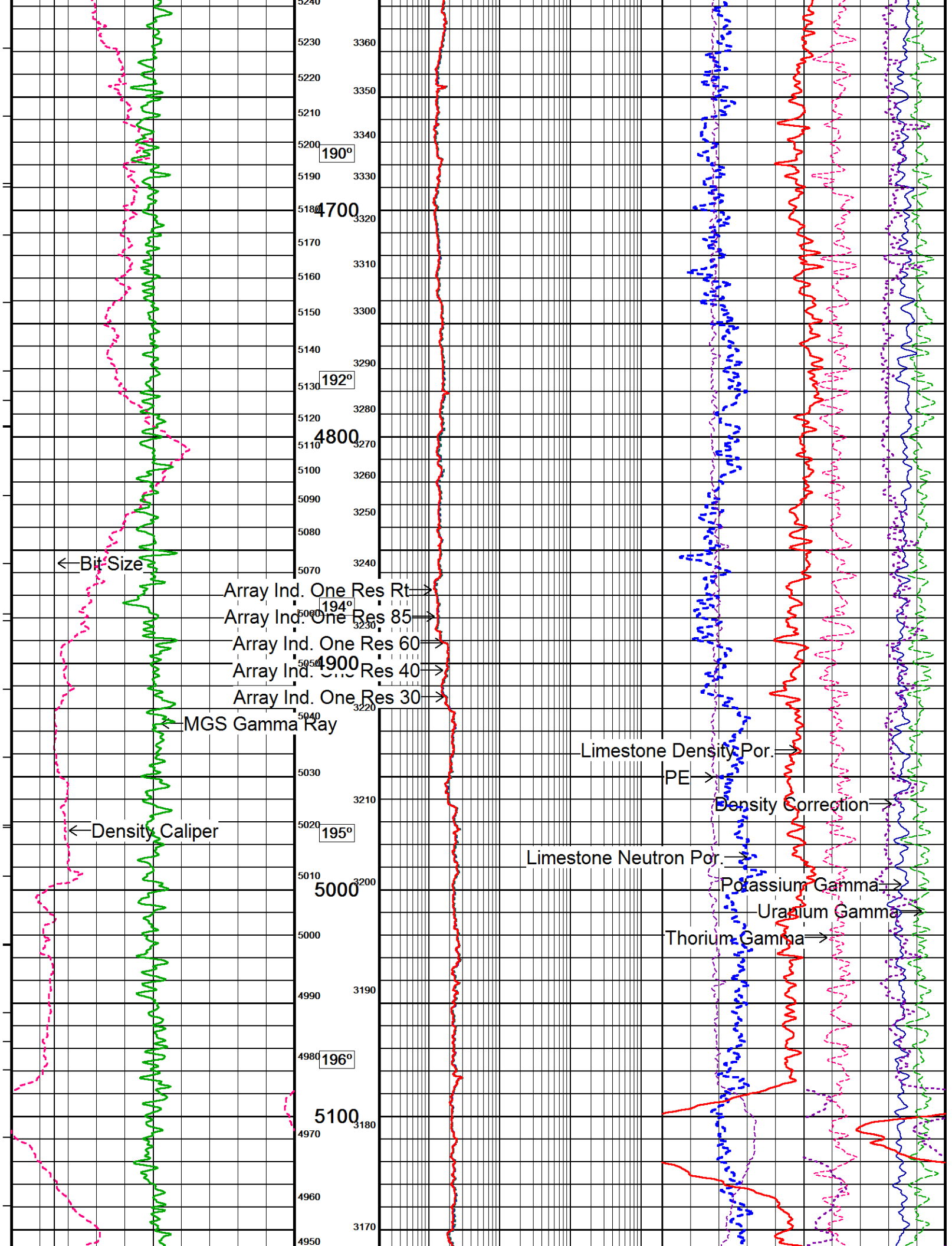


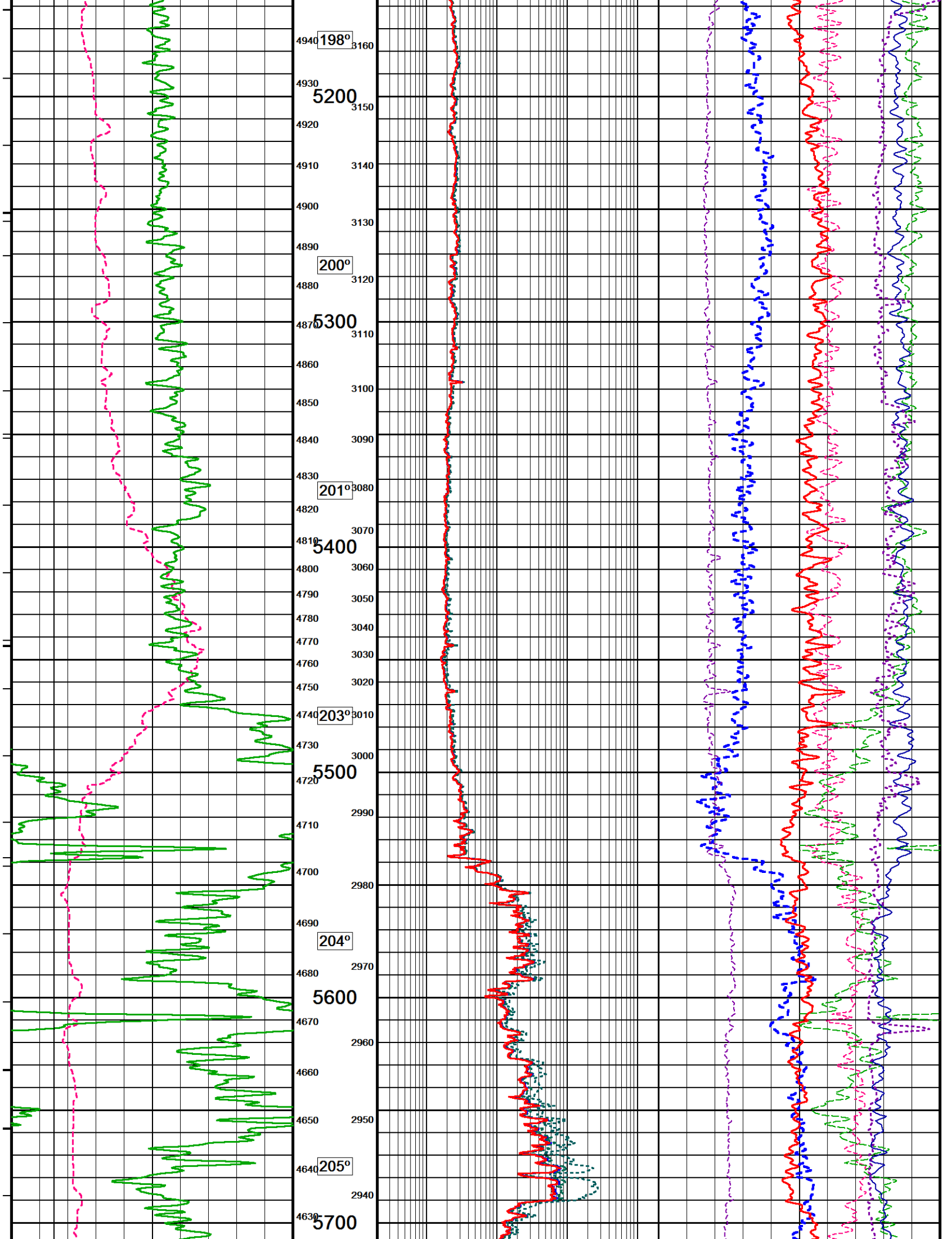


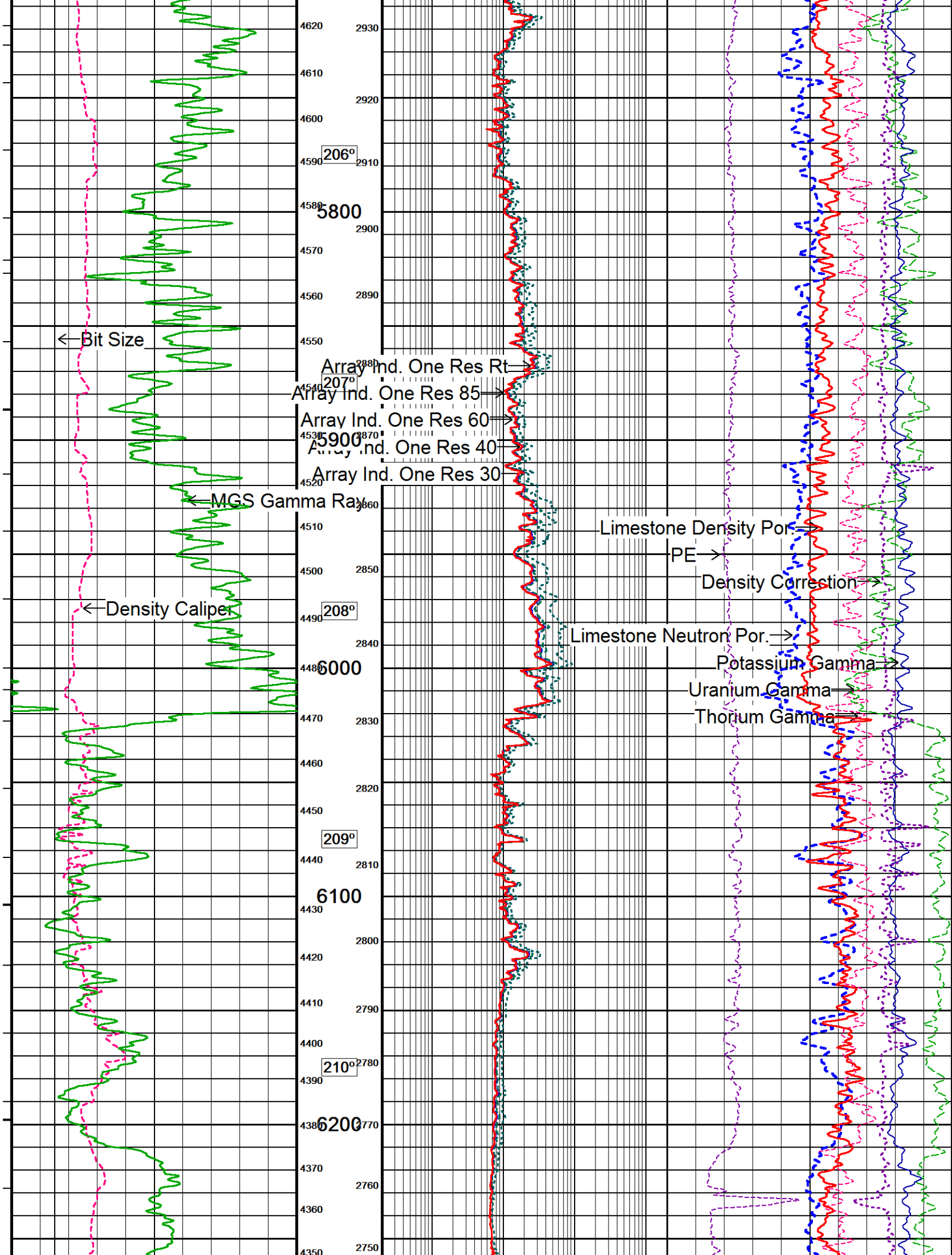


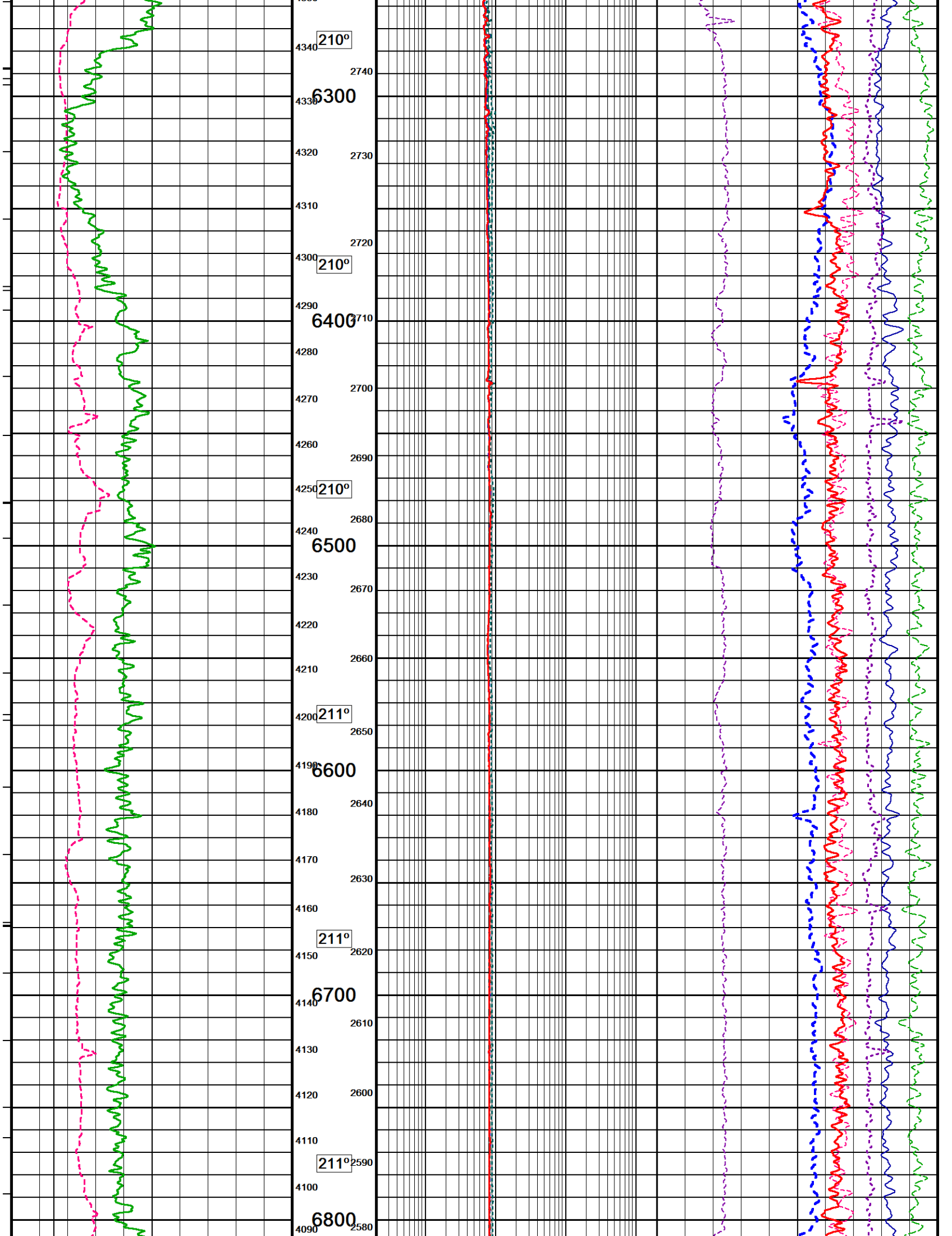


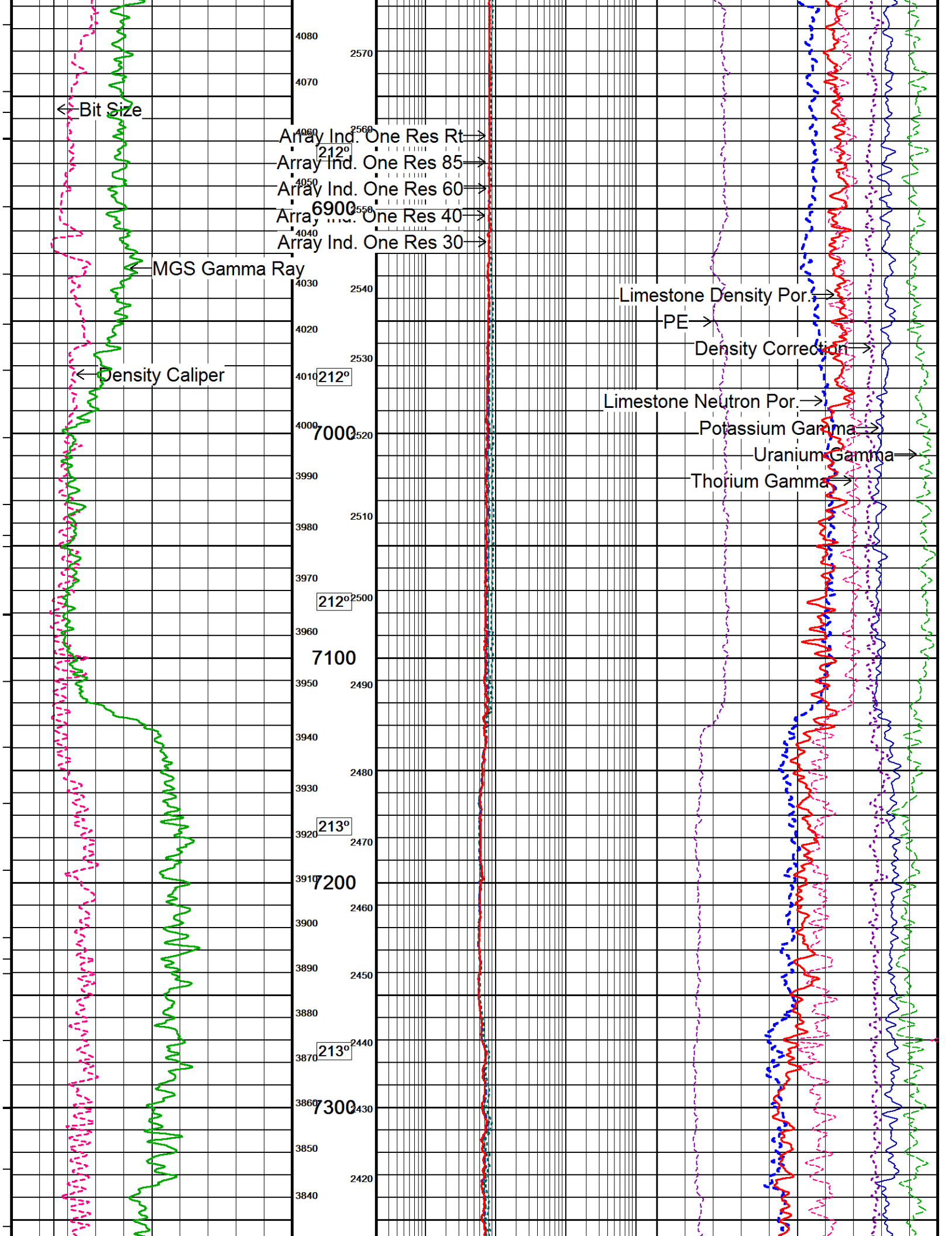


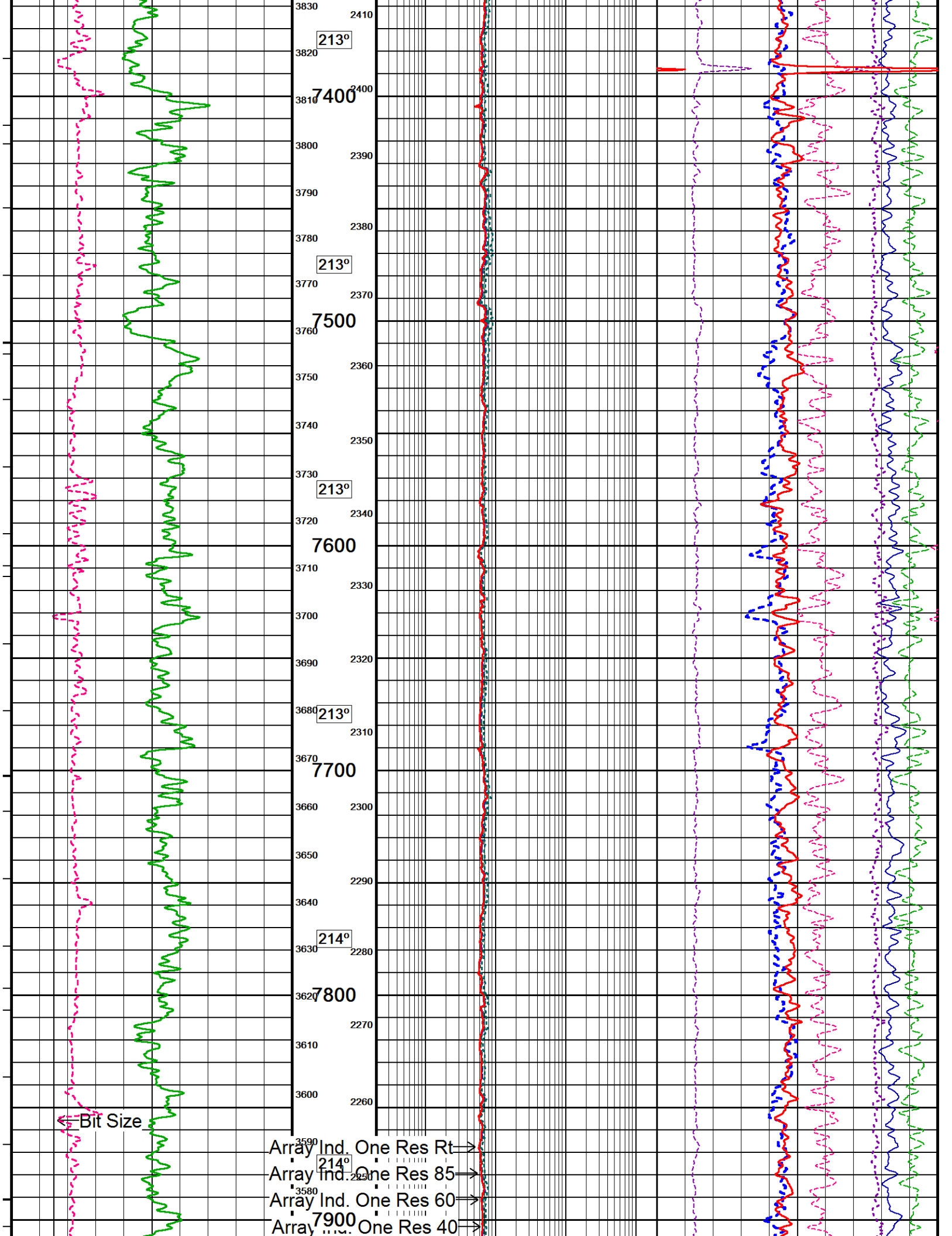


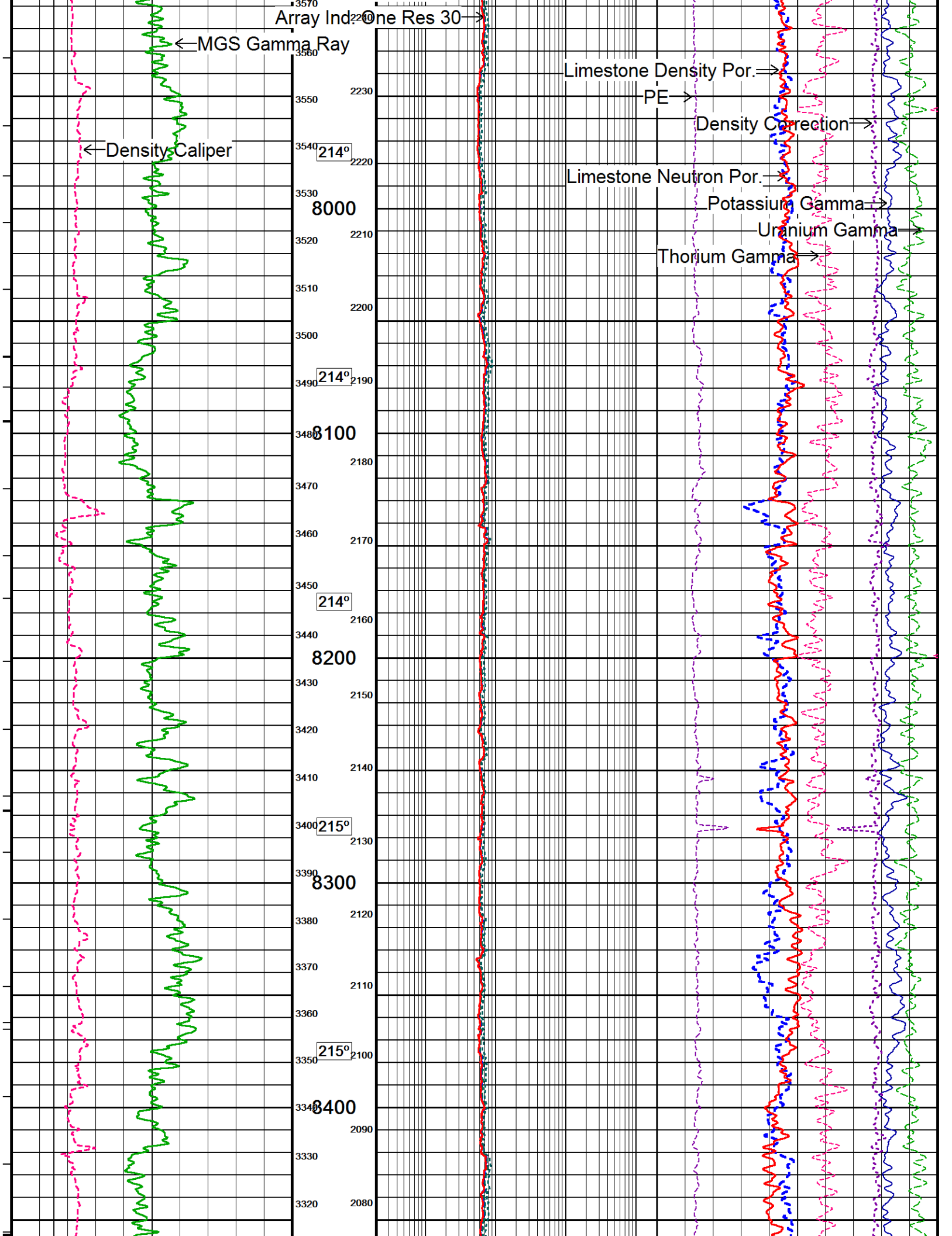


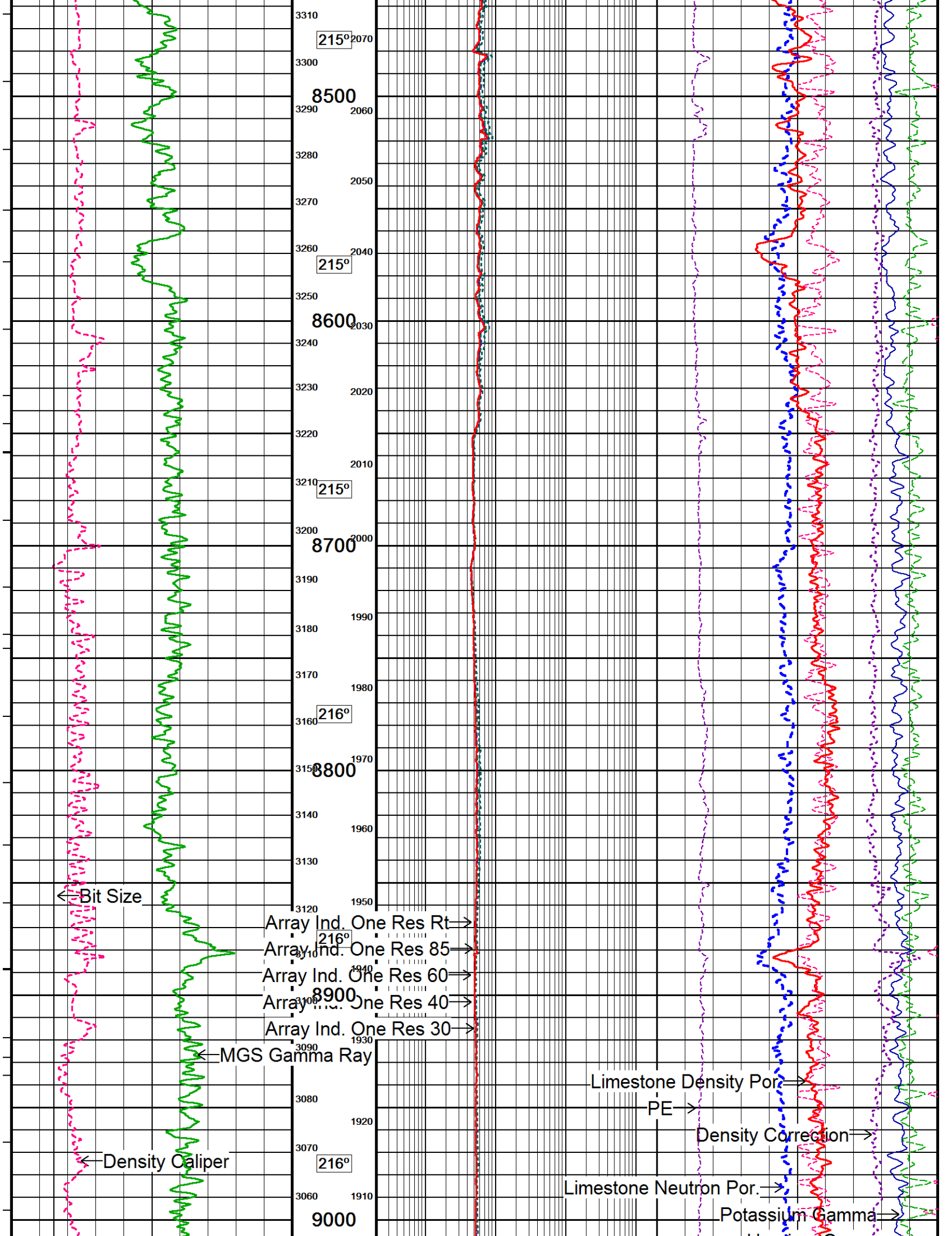


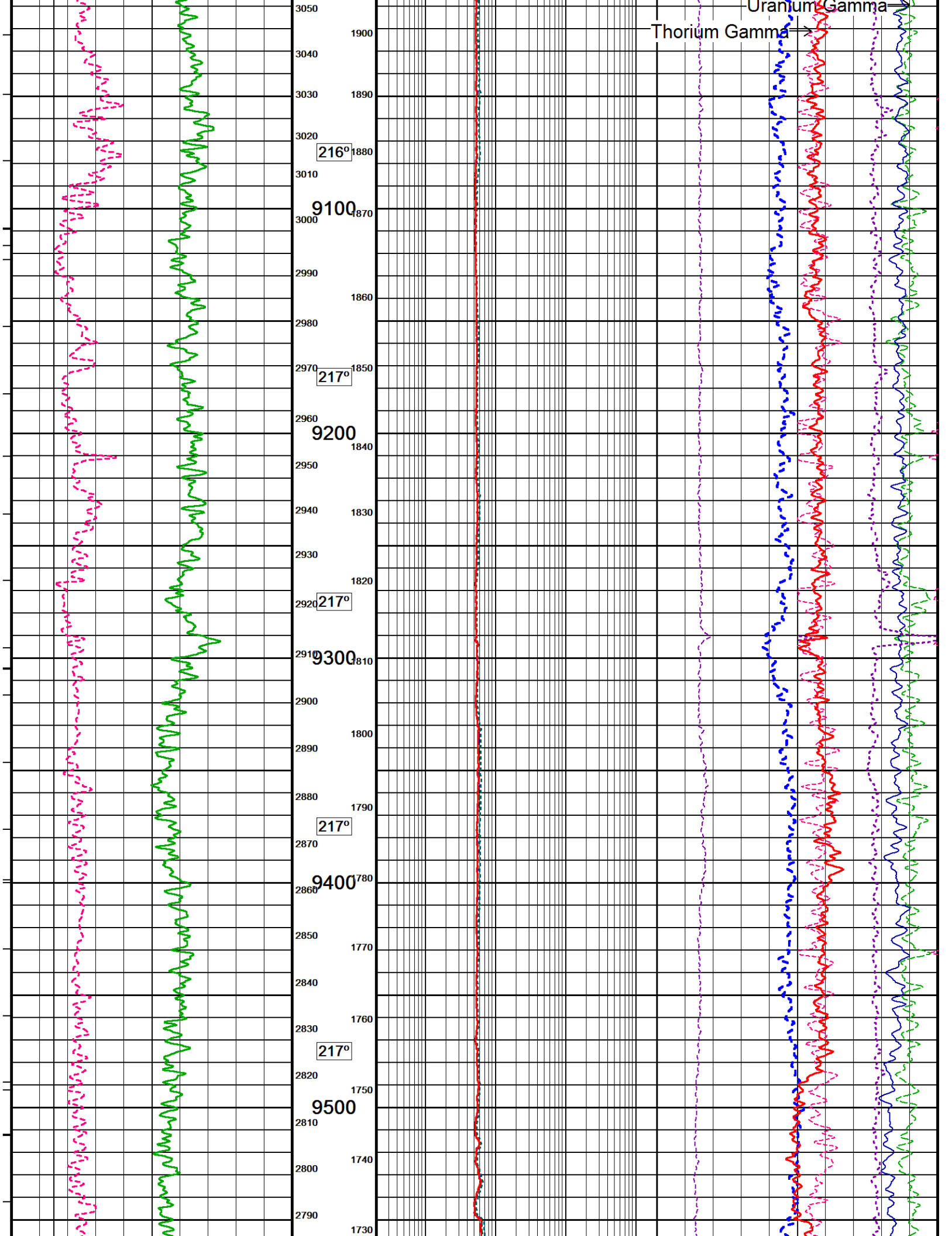


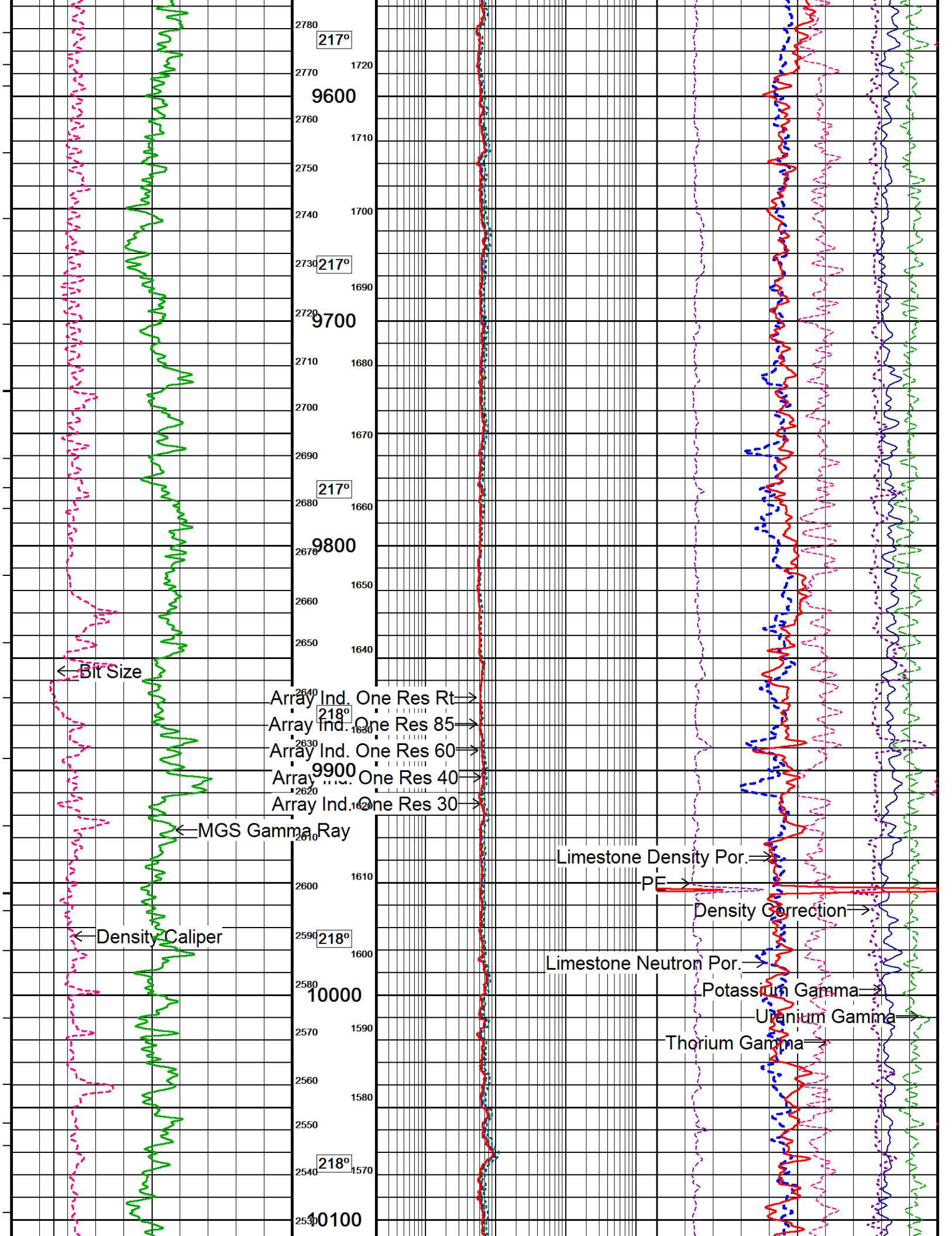


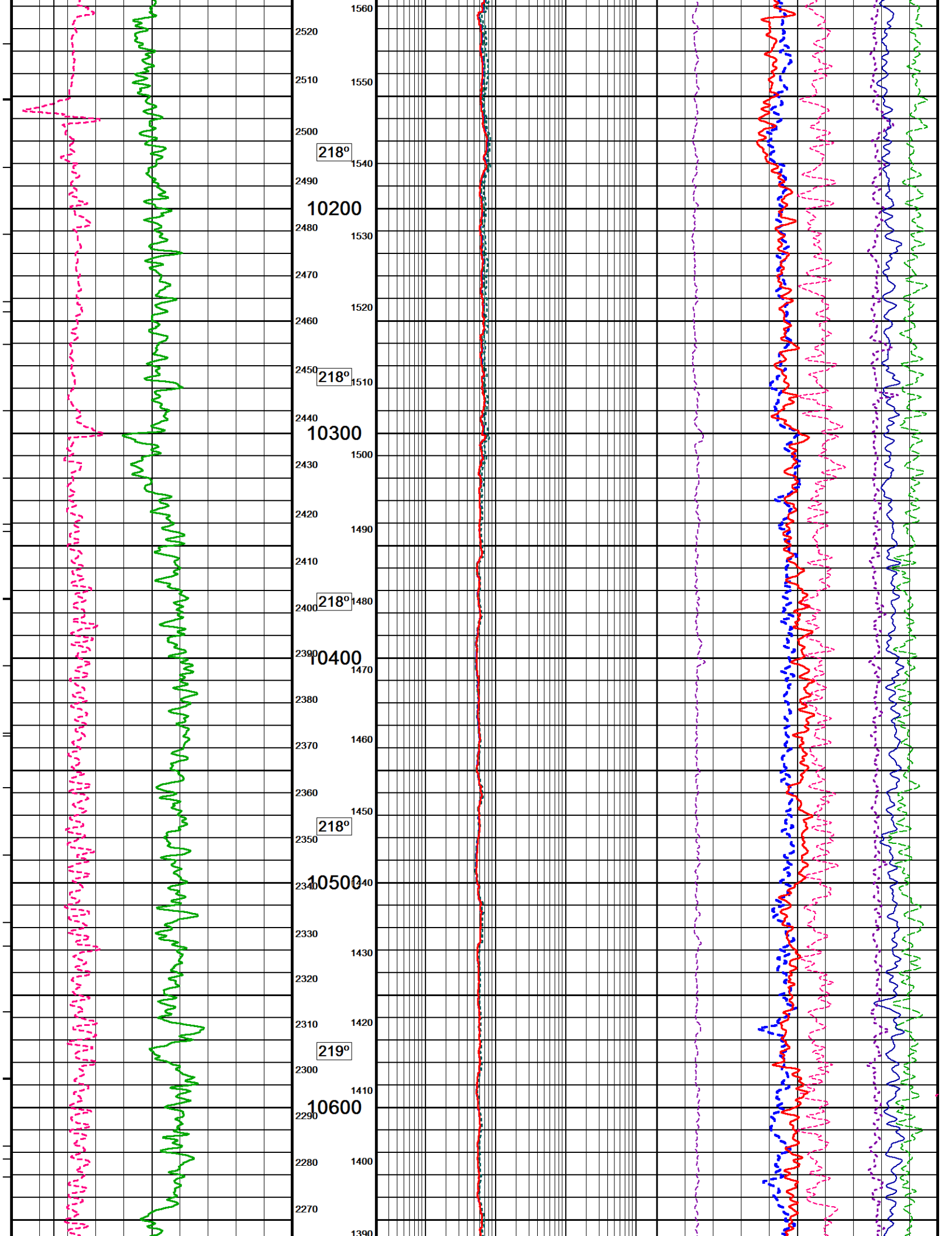


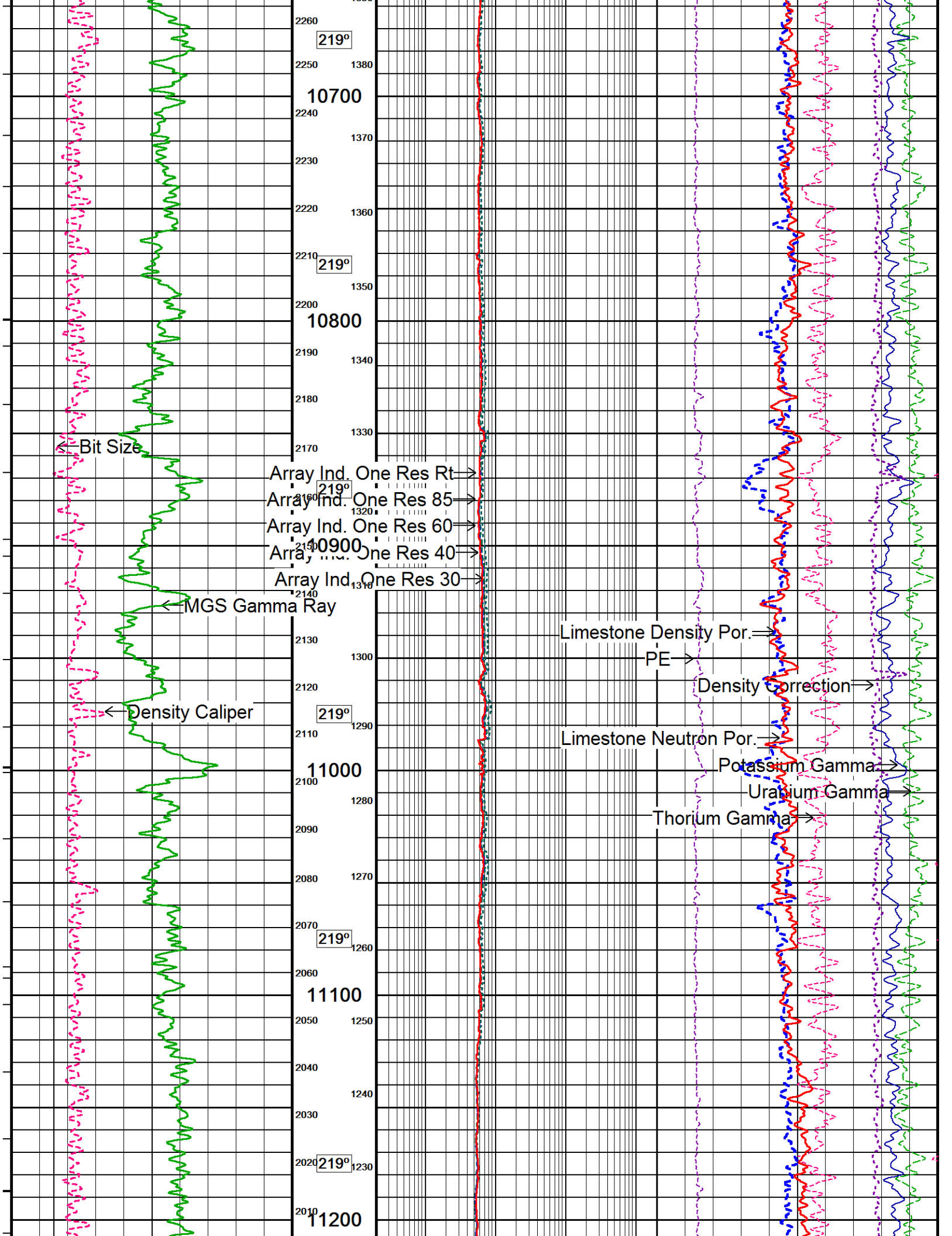


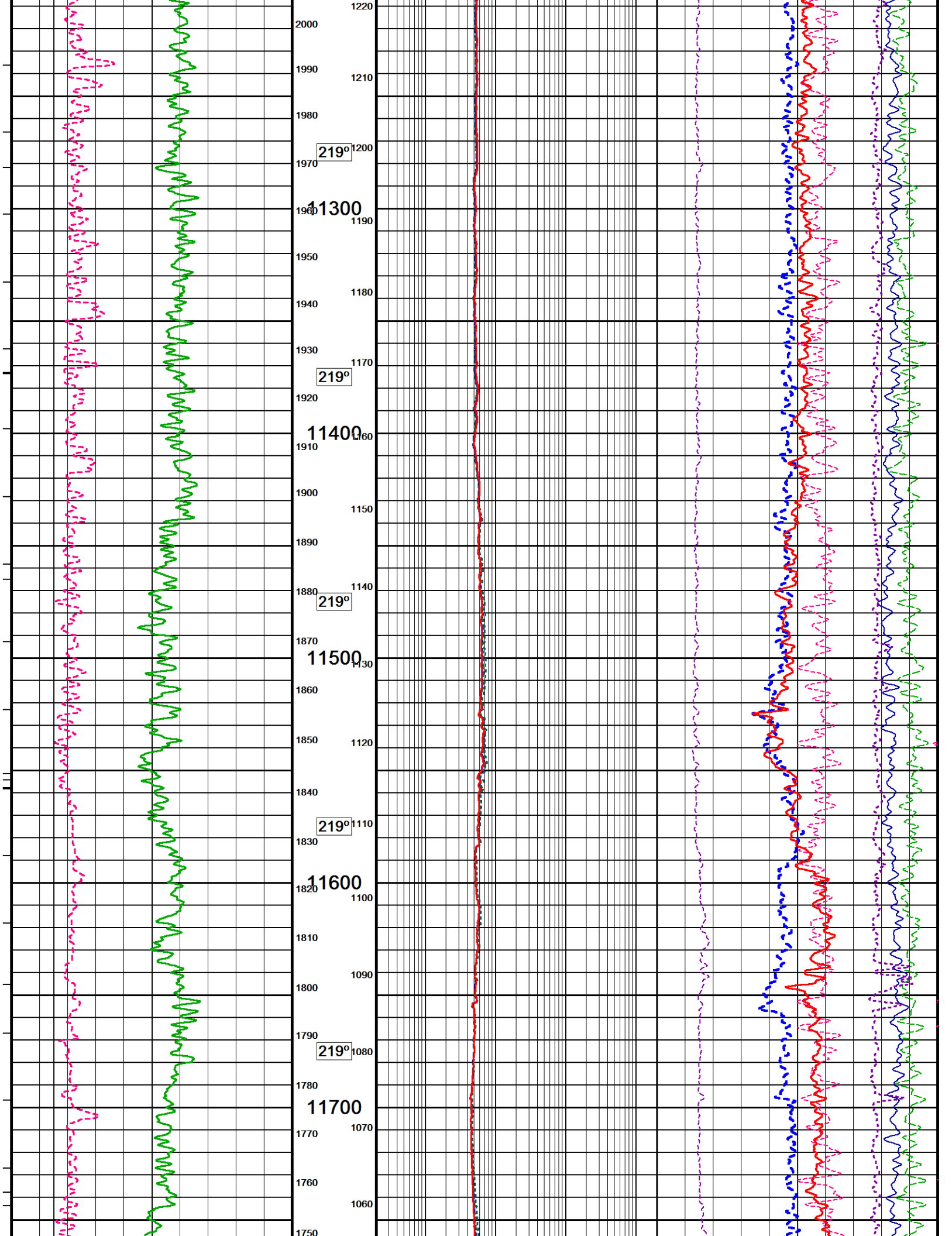


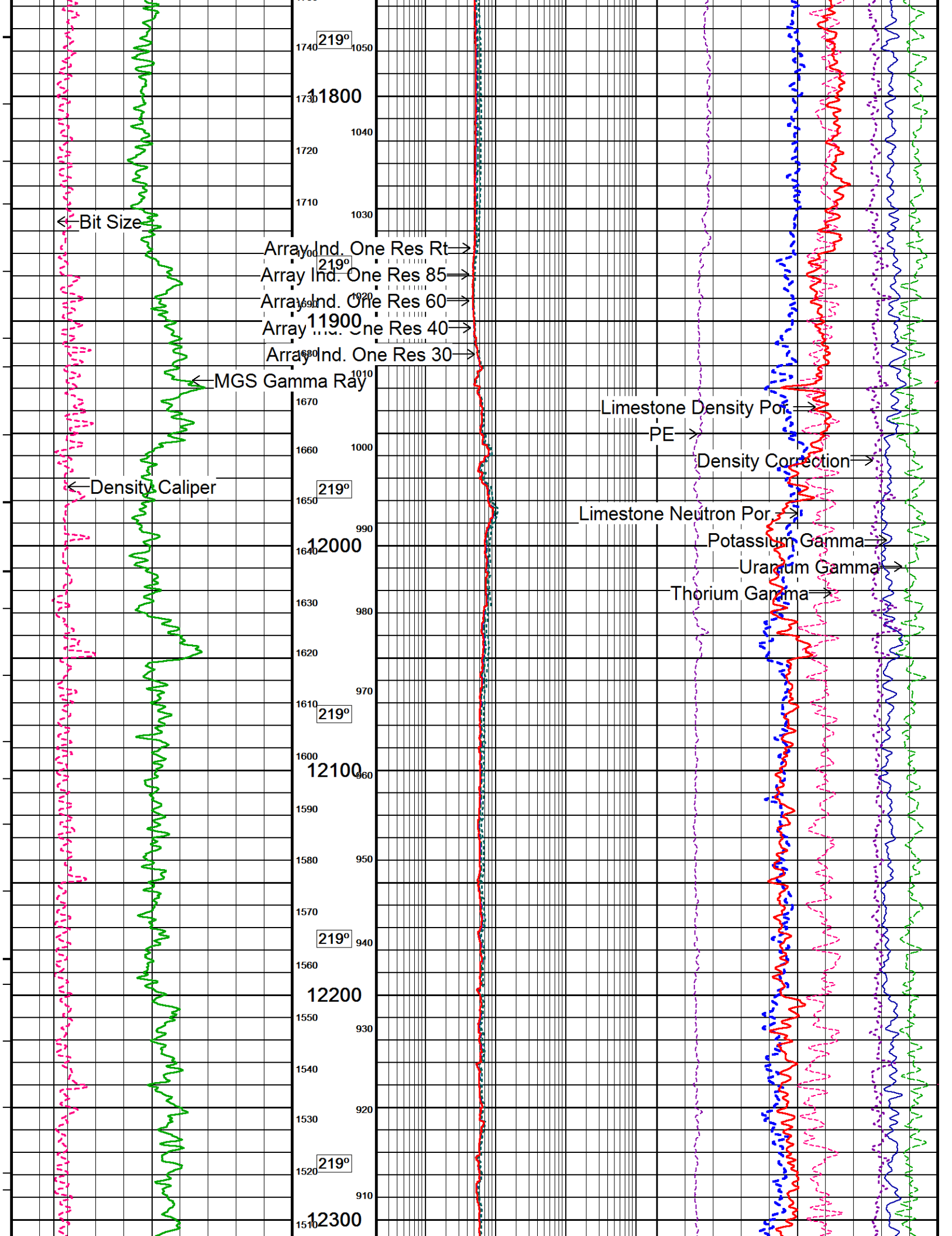


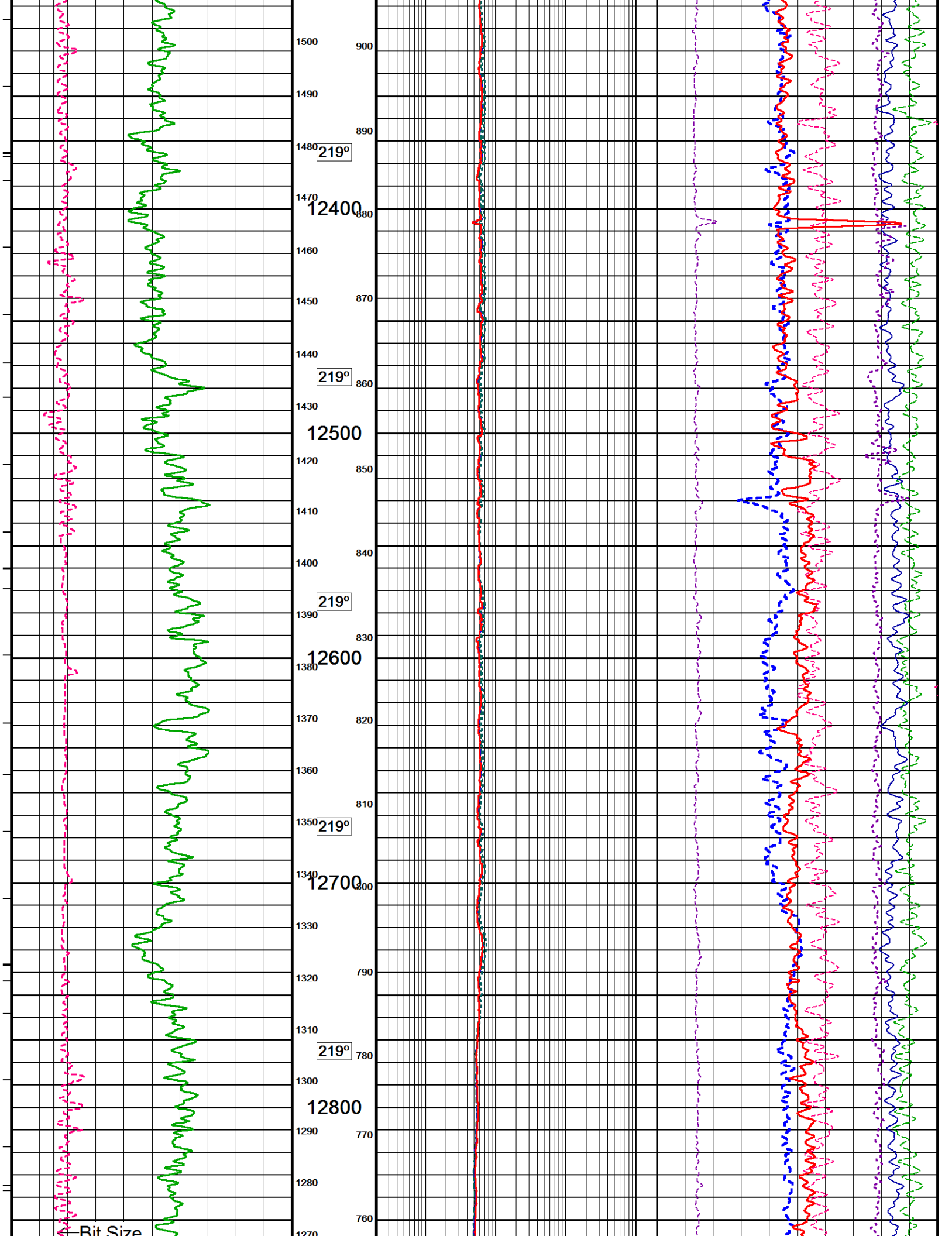


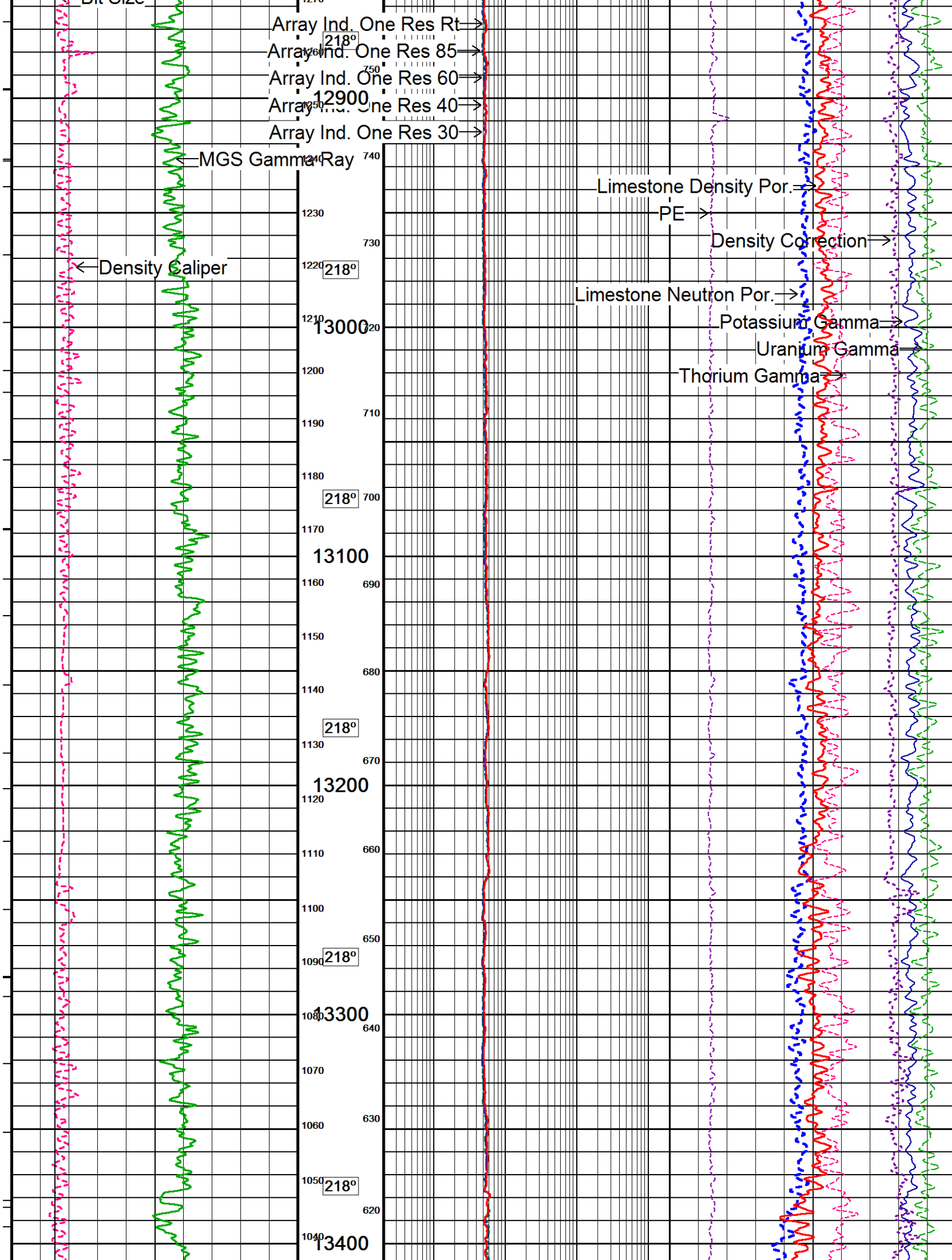


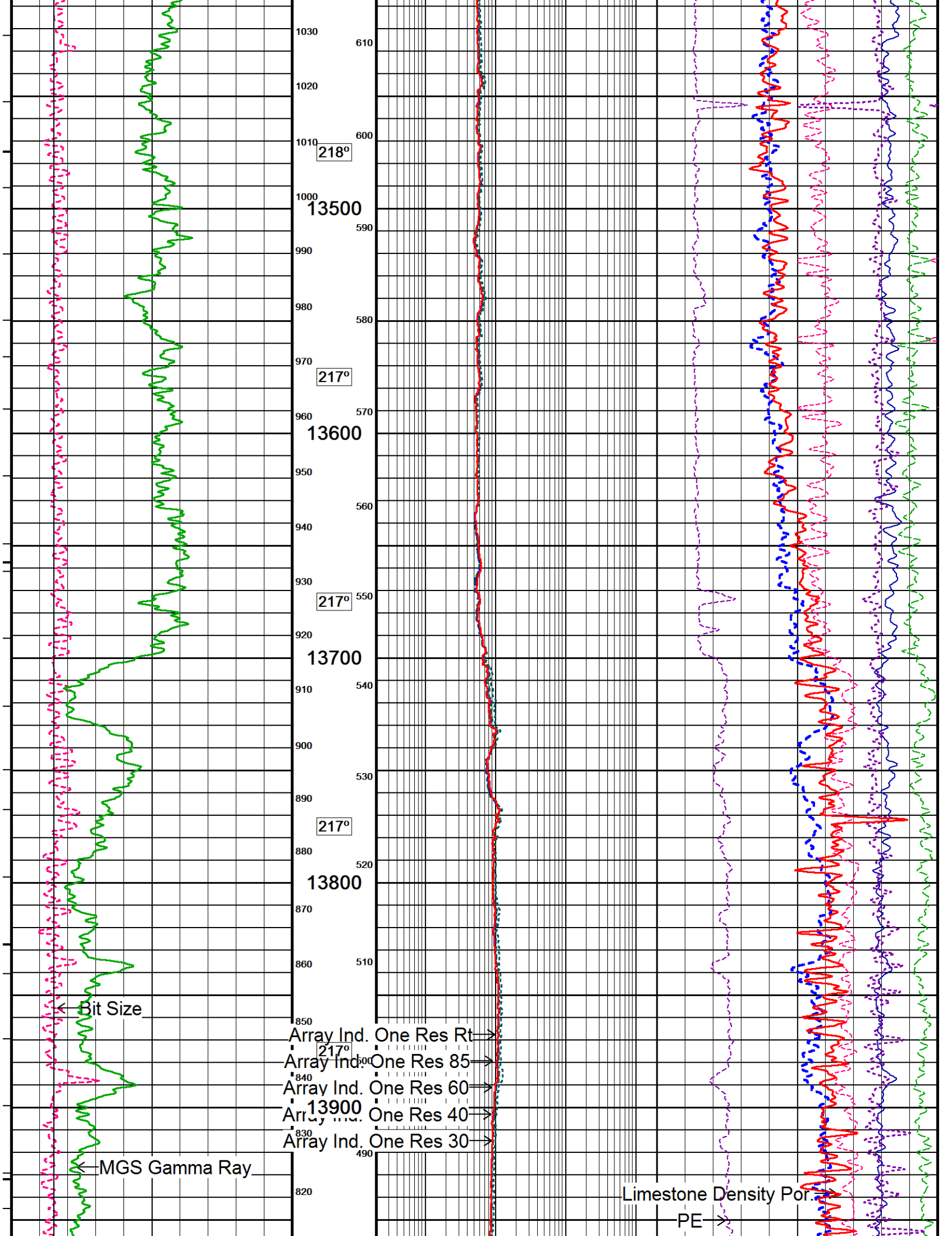


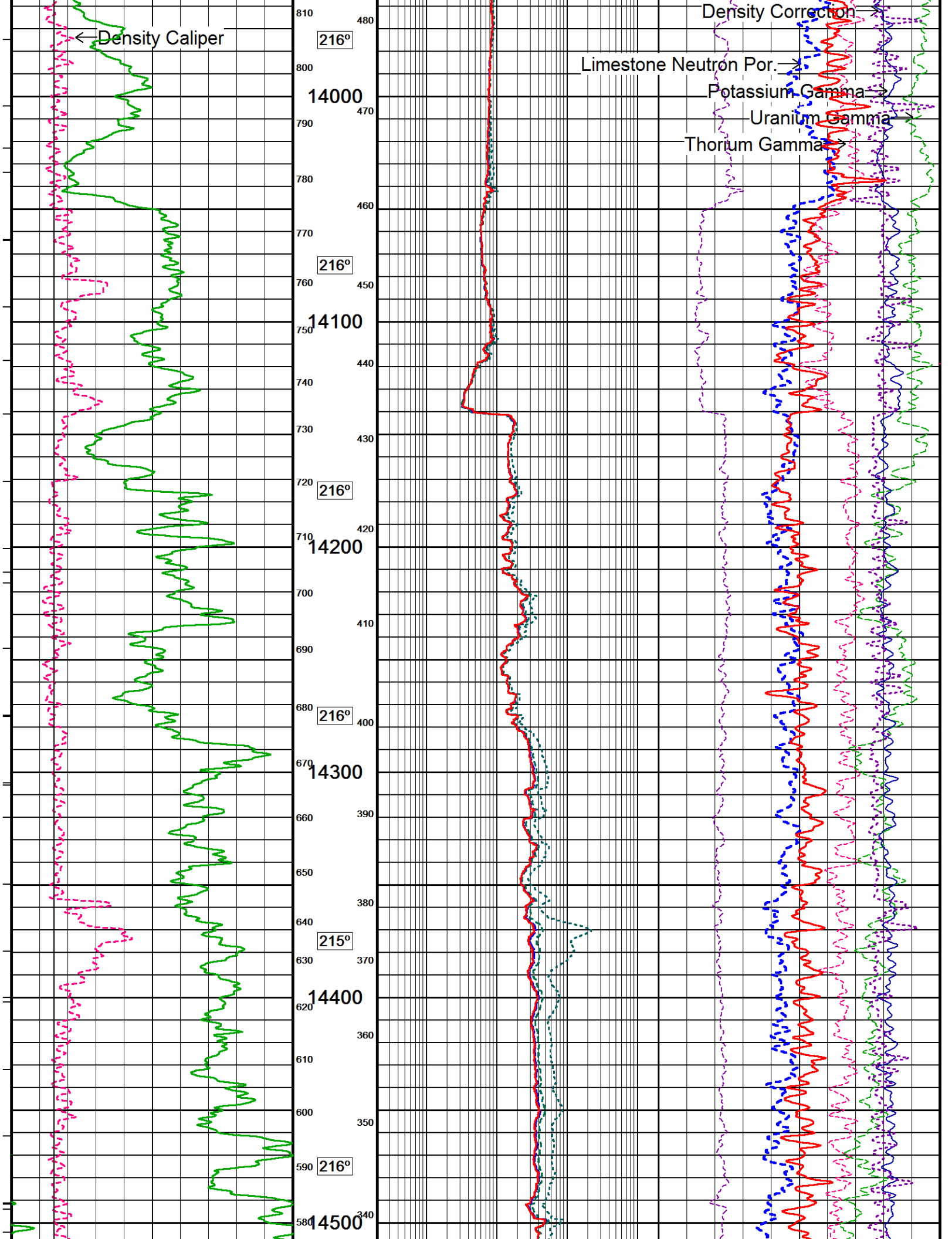


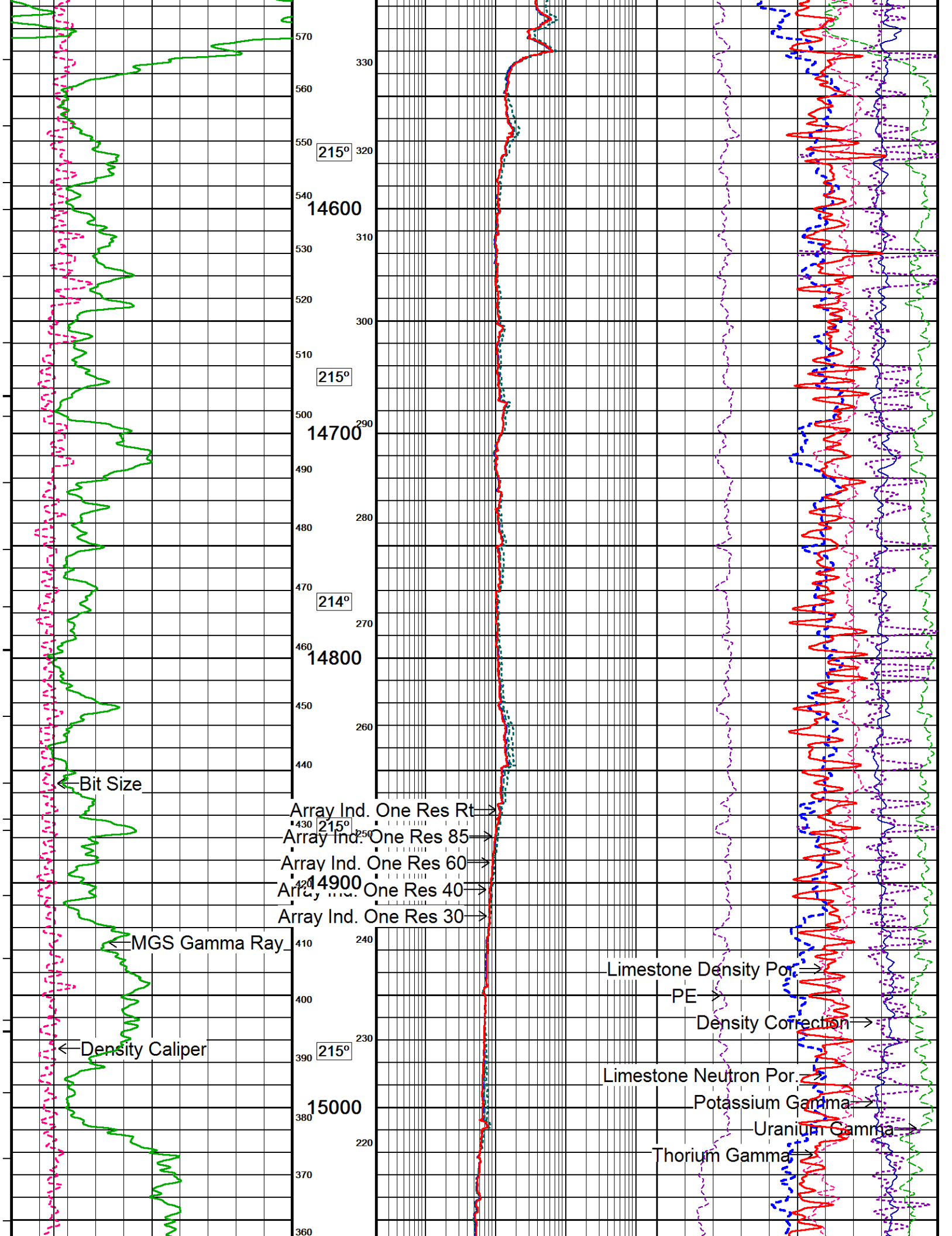


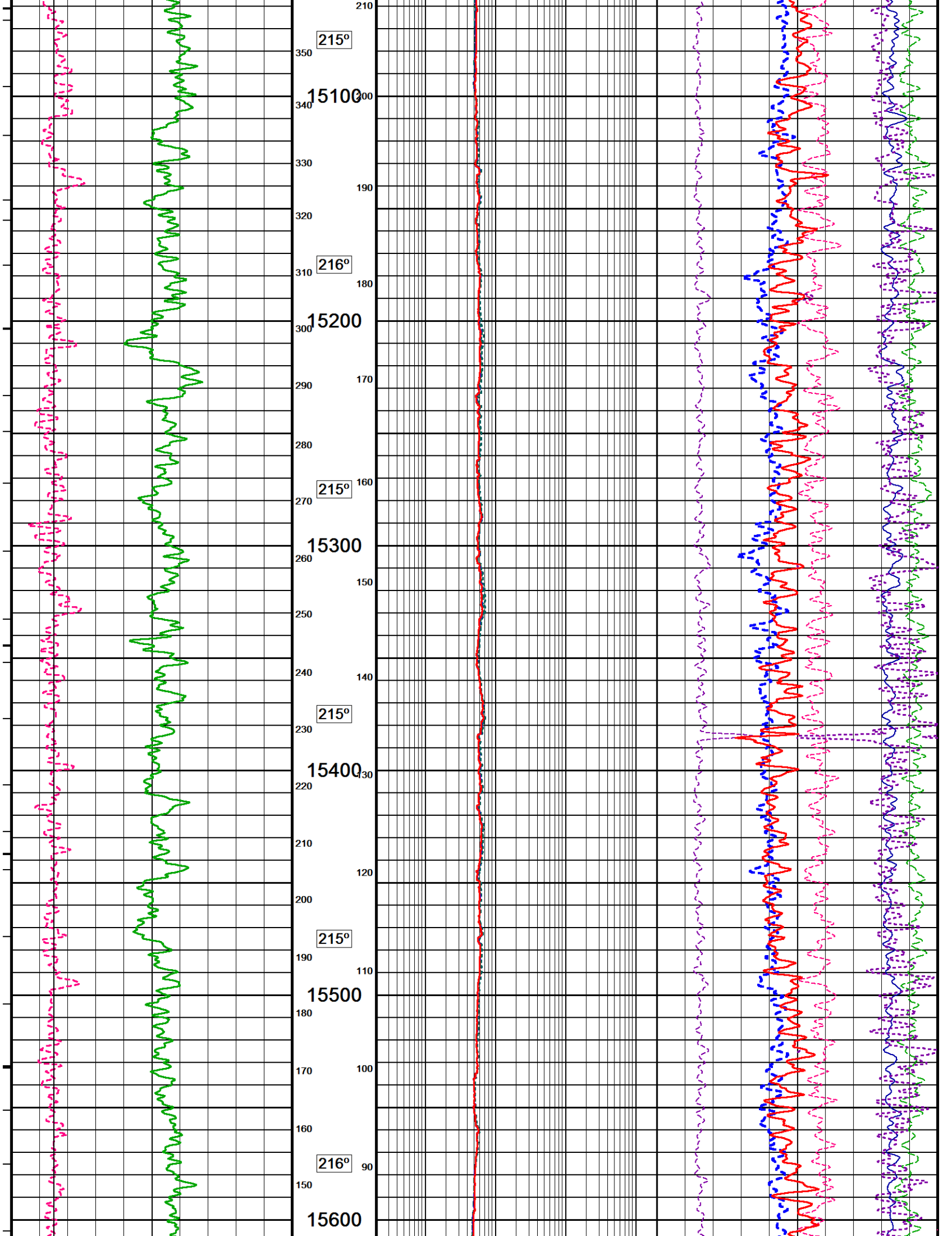


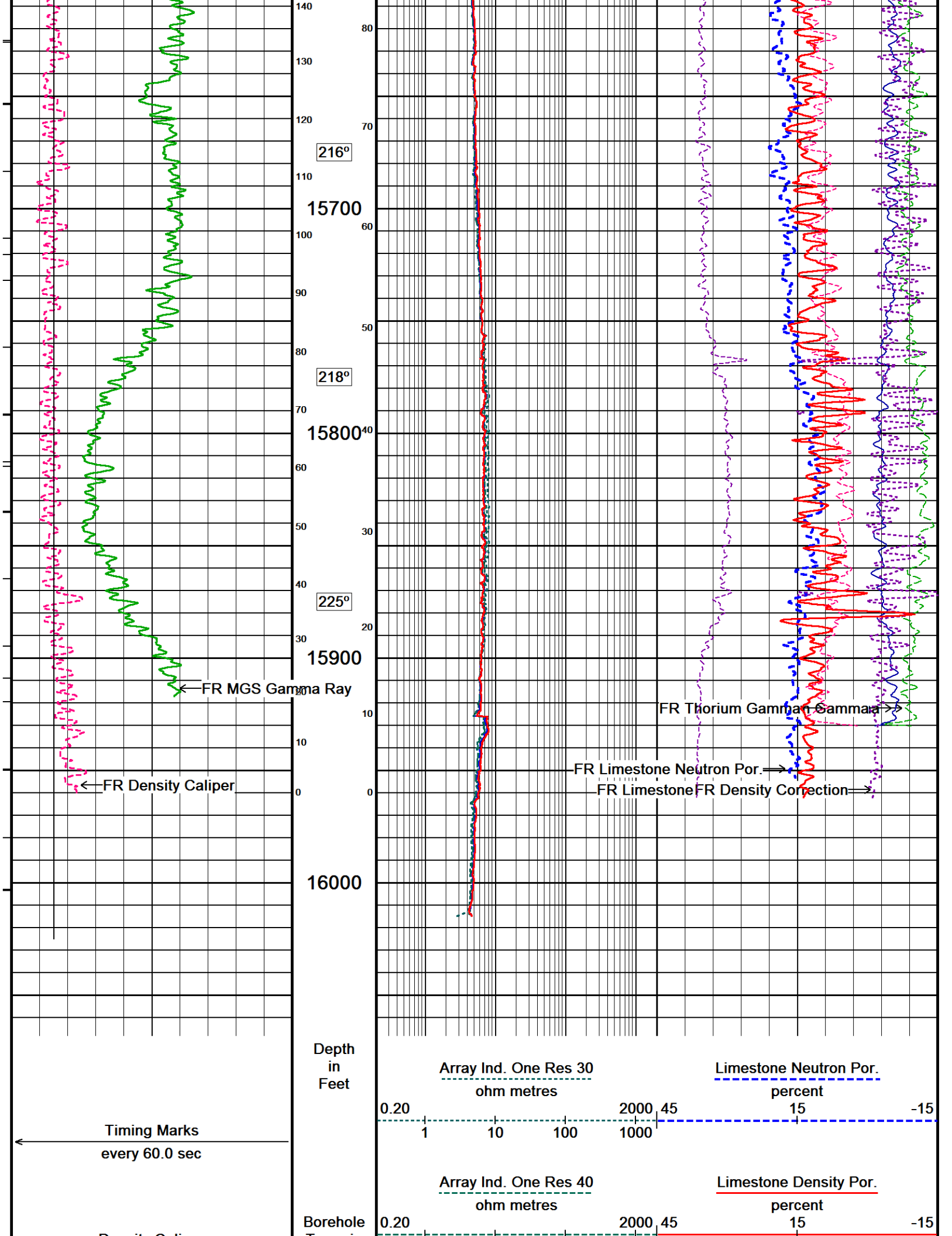


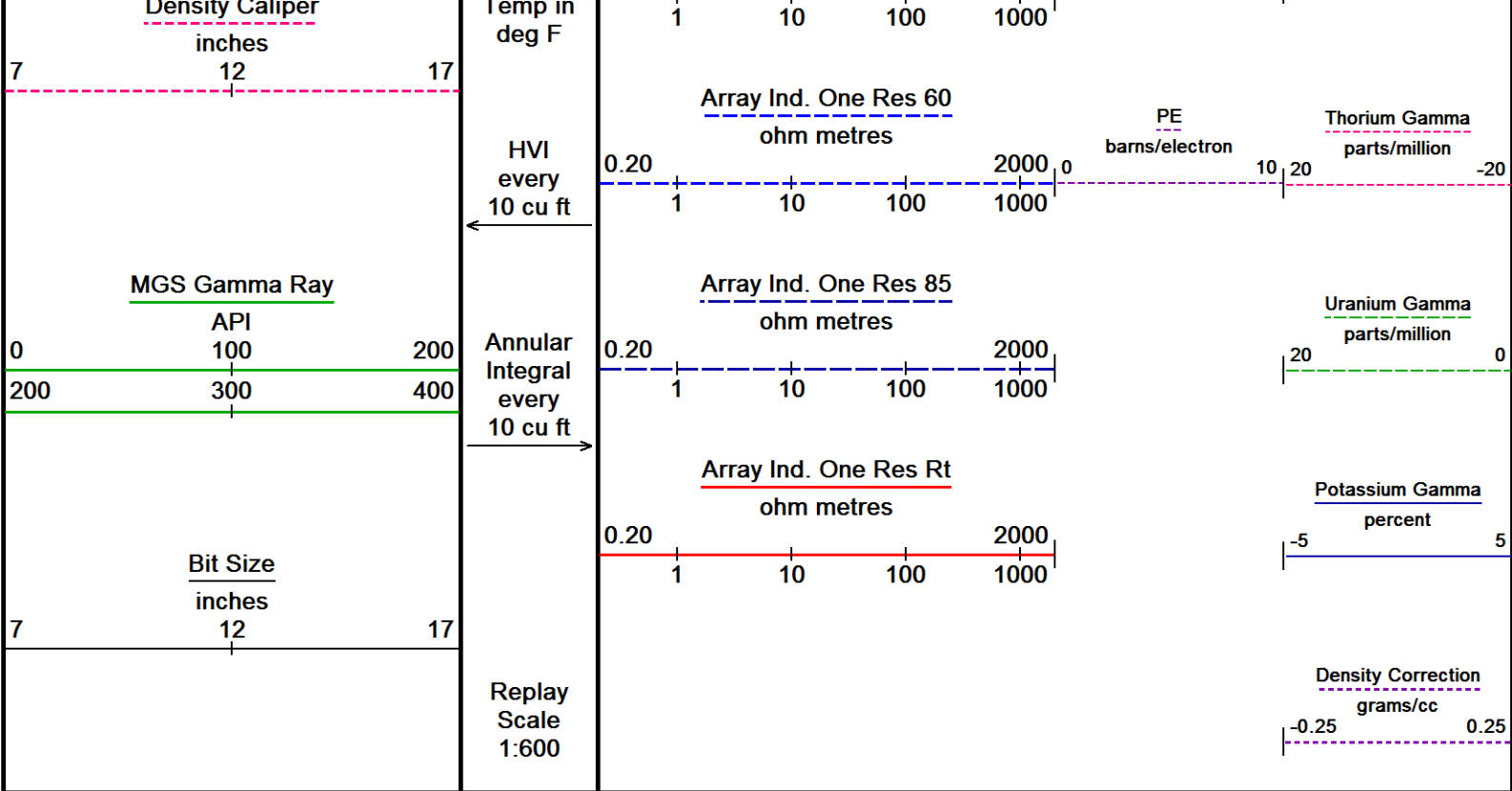








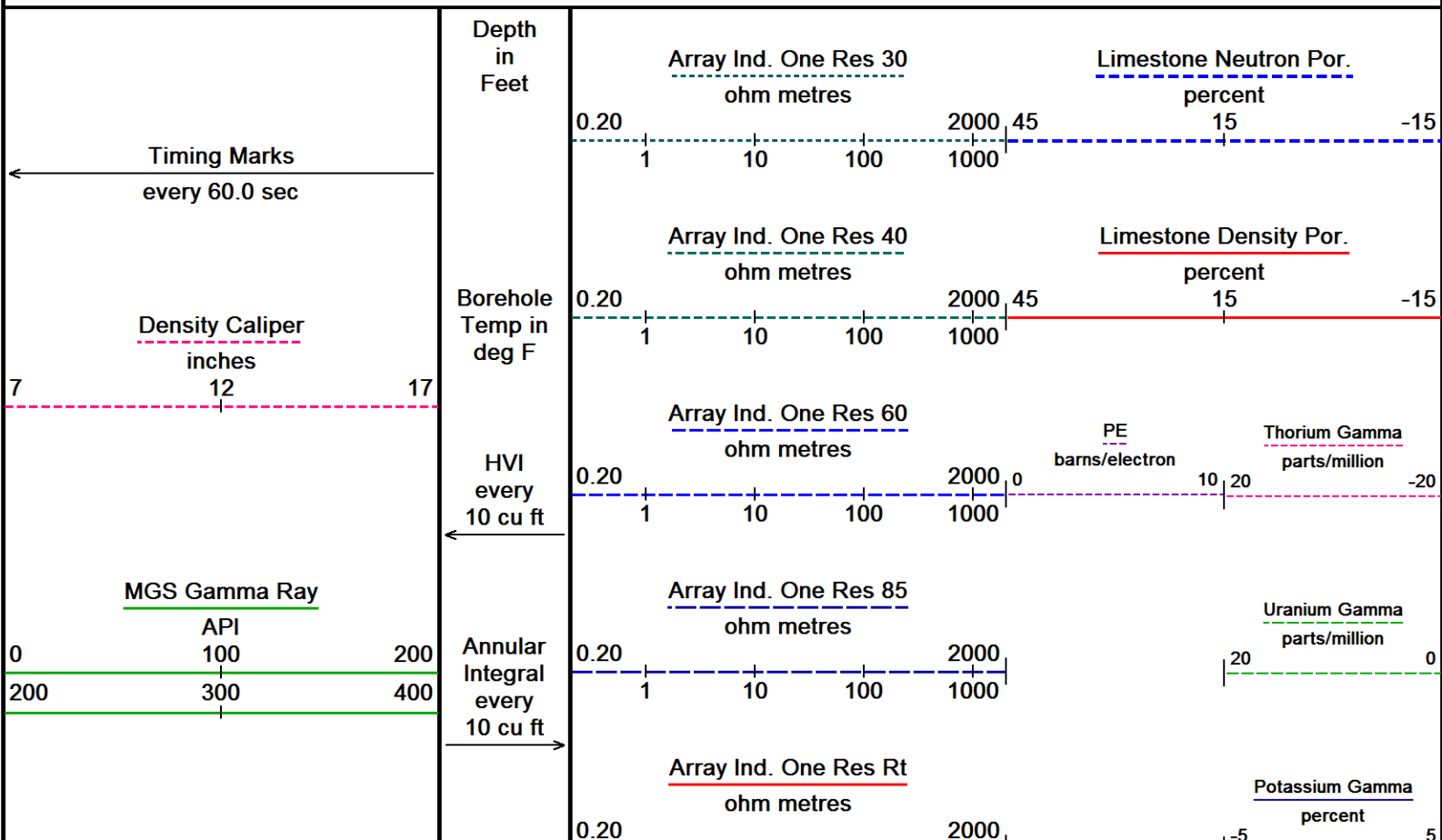




Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\JOBS\CML\Whiting\Razor 25O-2443\Logs\MMS-MAIN-FIELD.dta
System Versions: Logged with 16.01.9040 Processed with 16.01.9040 Plotted with 16.03.839

2 INCH MAIN LOG 1:600

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\JOBS\CML\Whiting\Razor 25O-2443\Logs\MMS-MAIN-FIELD.dta
System Versions: Logged with 16.01.9040 Processed with 16.01.9040 Plotted with 16.03.839



Bit Size

inches

12

7

17

Replay
Scale
1:240

286

300

350

← Bit Size

← MGS Gamma Ray

108°

400

109°

450

1

10

100

1000

Density Correction

grams/cc

-0.25

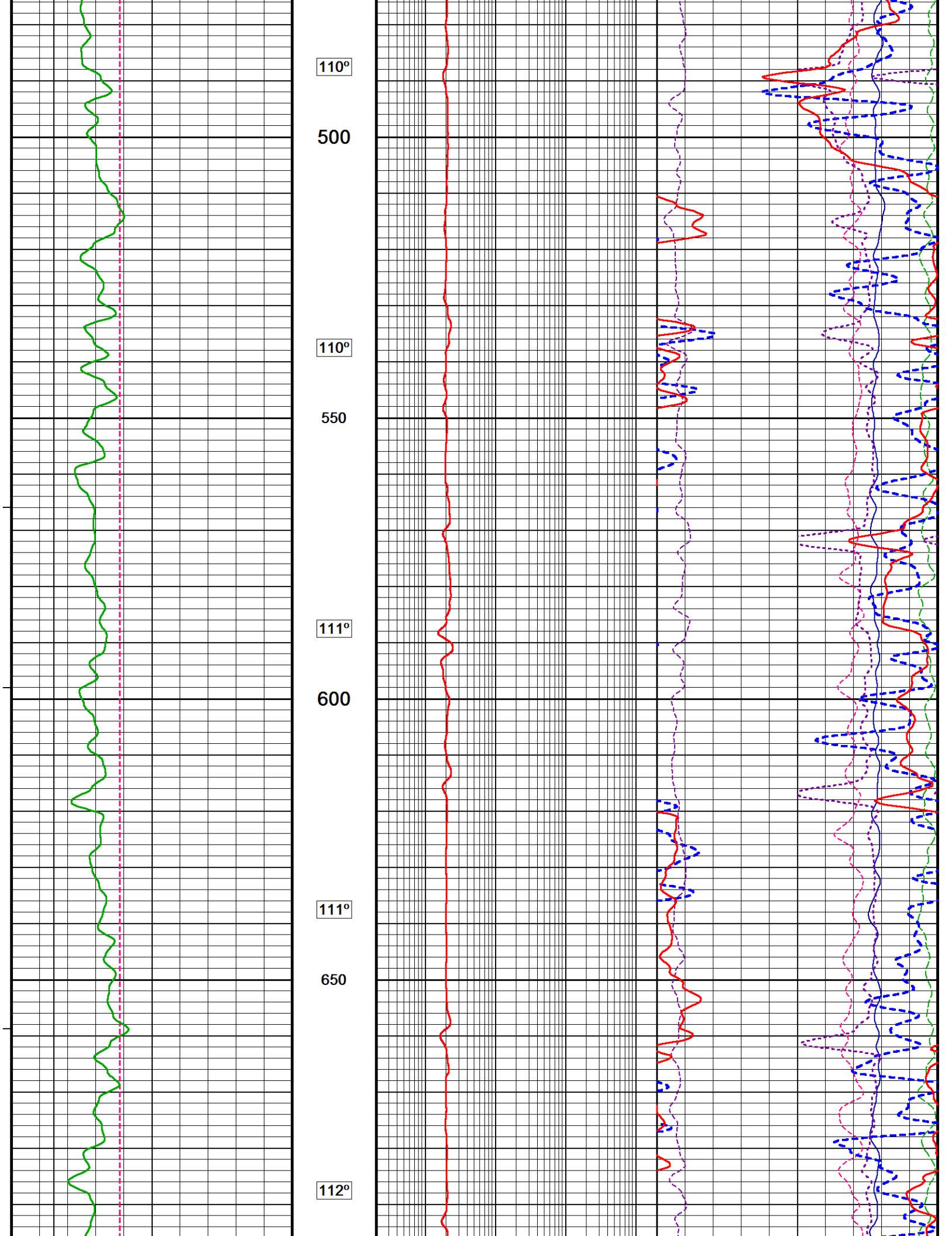
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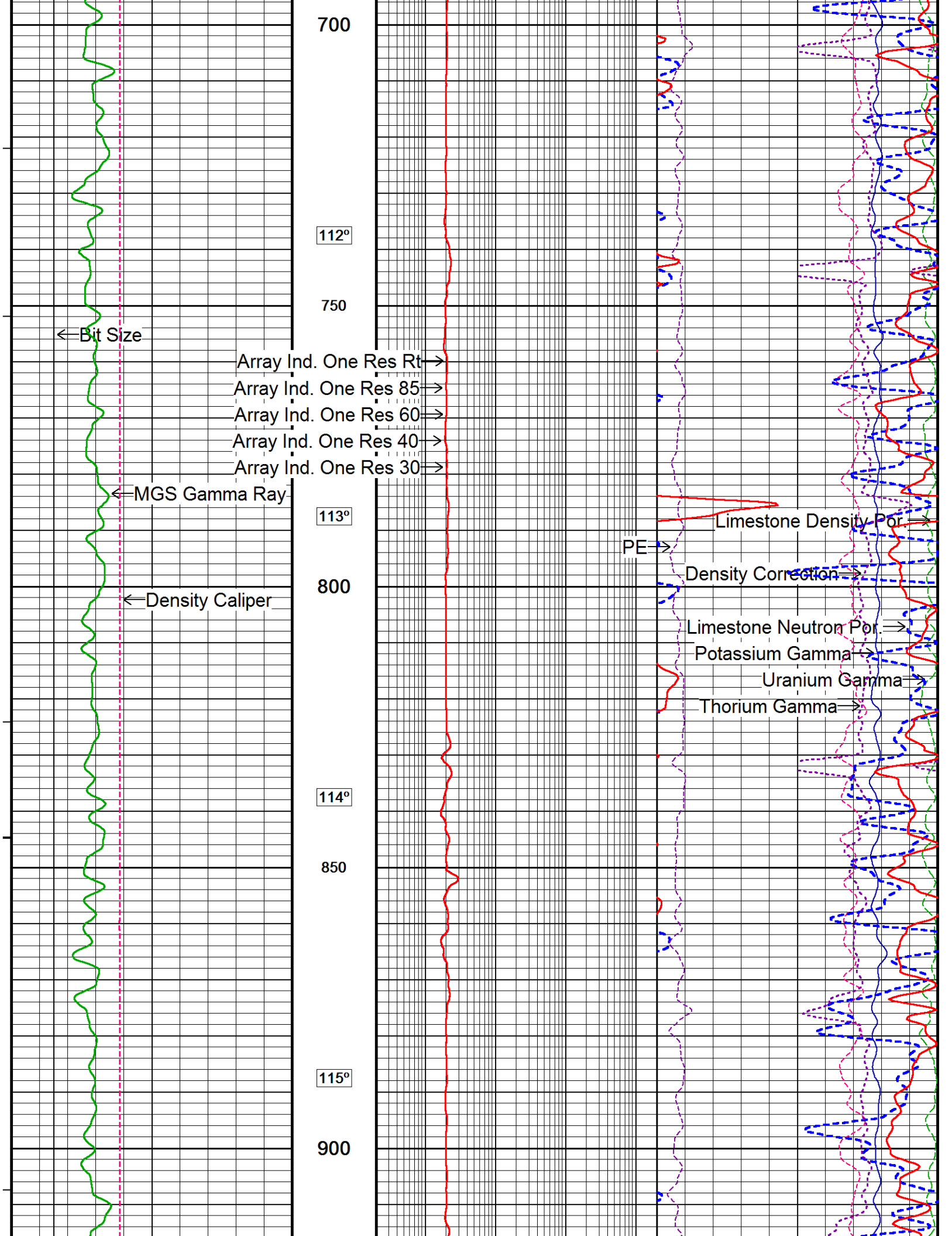
Limestone Neutron Por. →

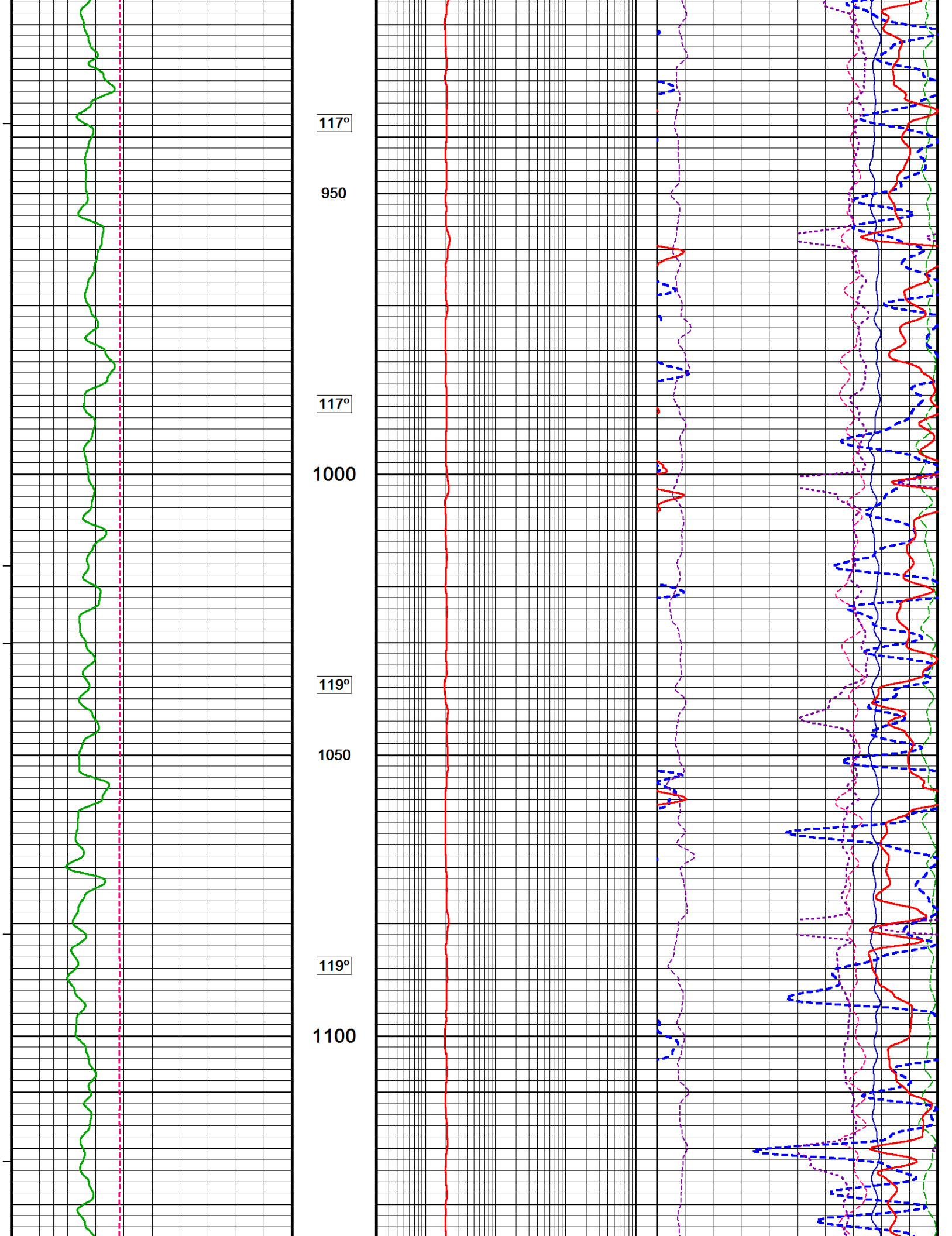
Potassium Gamma →

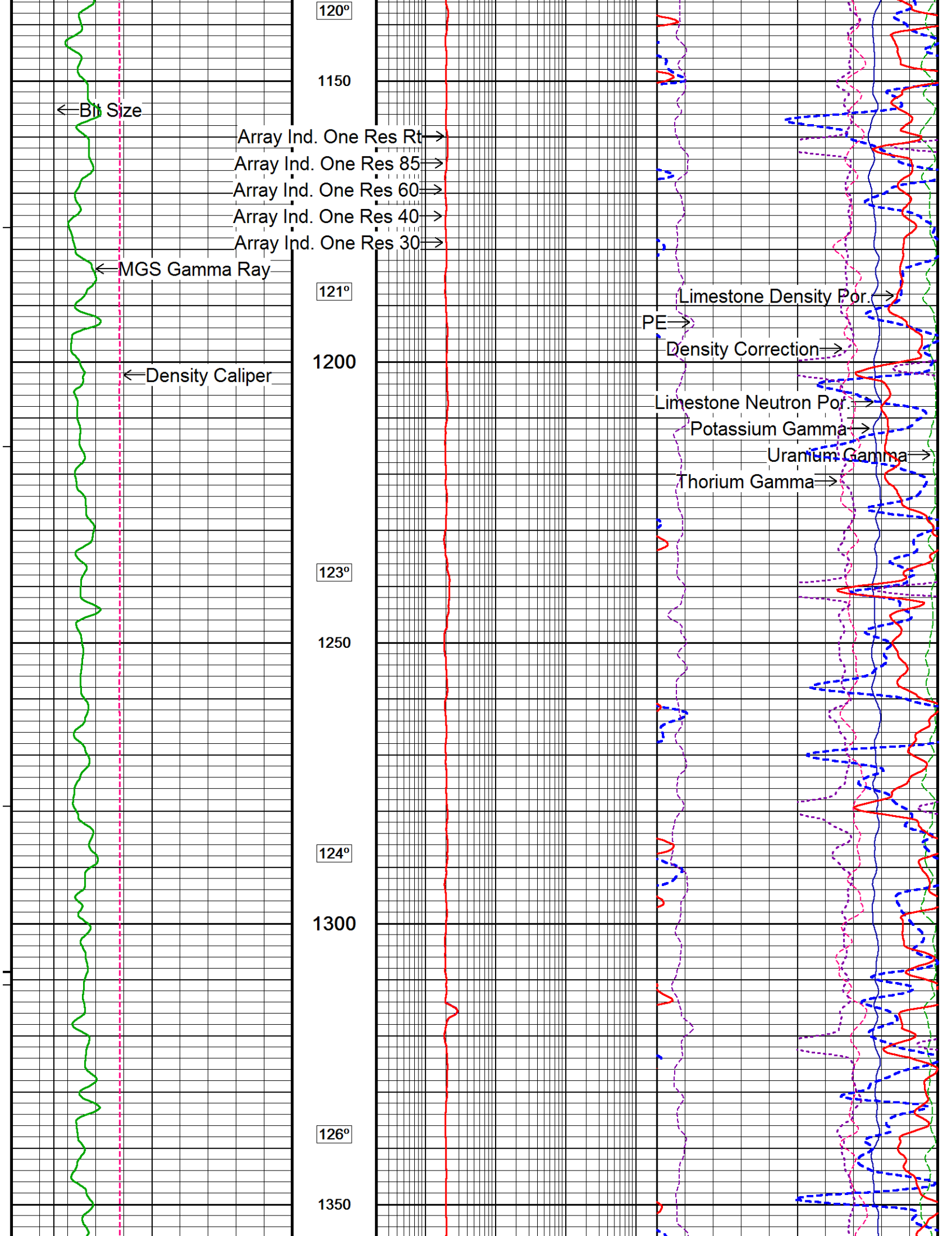
Uranium Gamma →

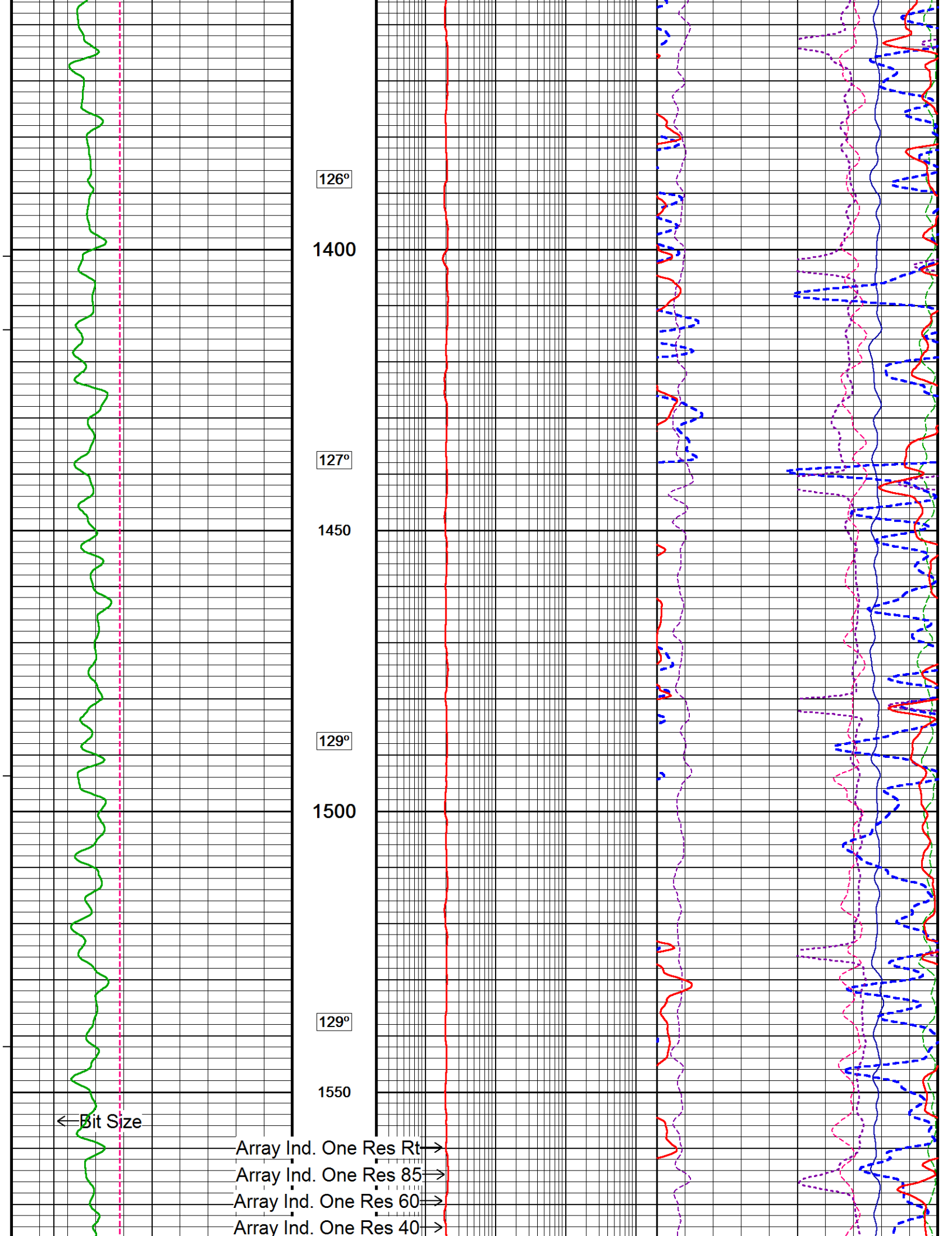
Thorium Gamma →

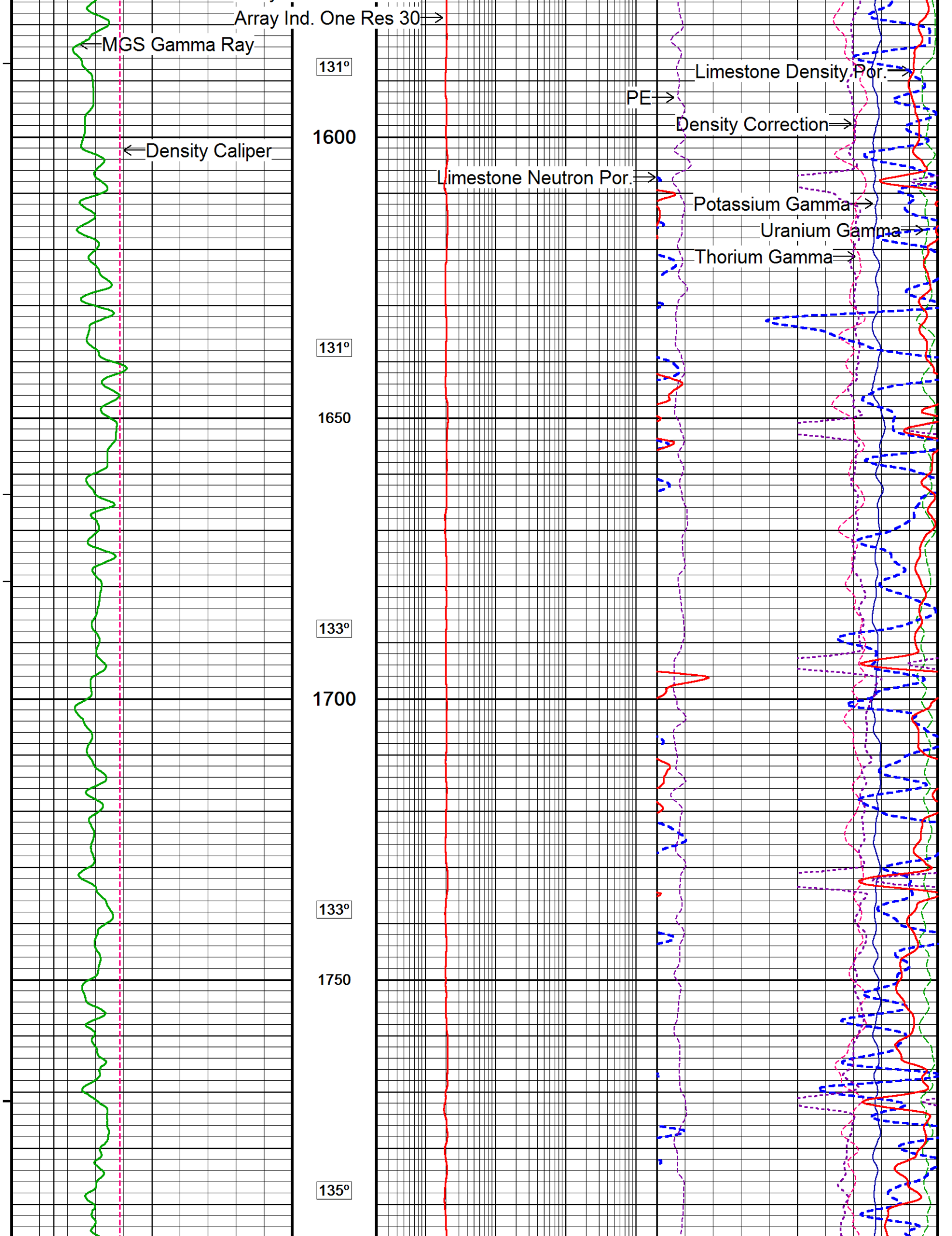


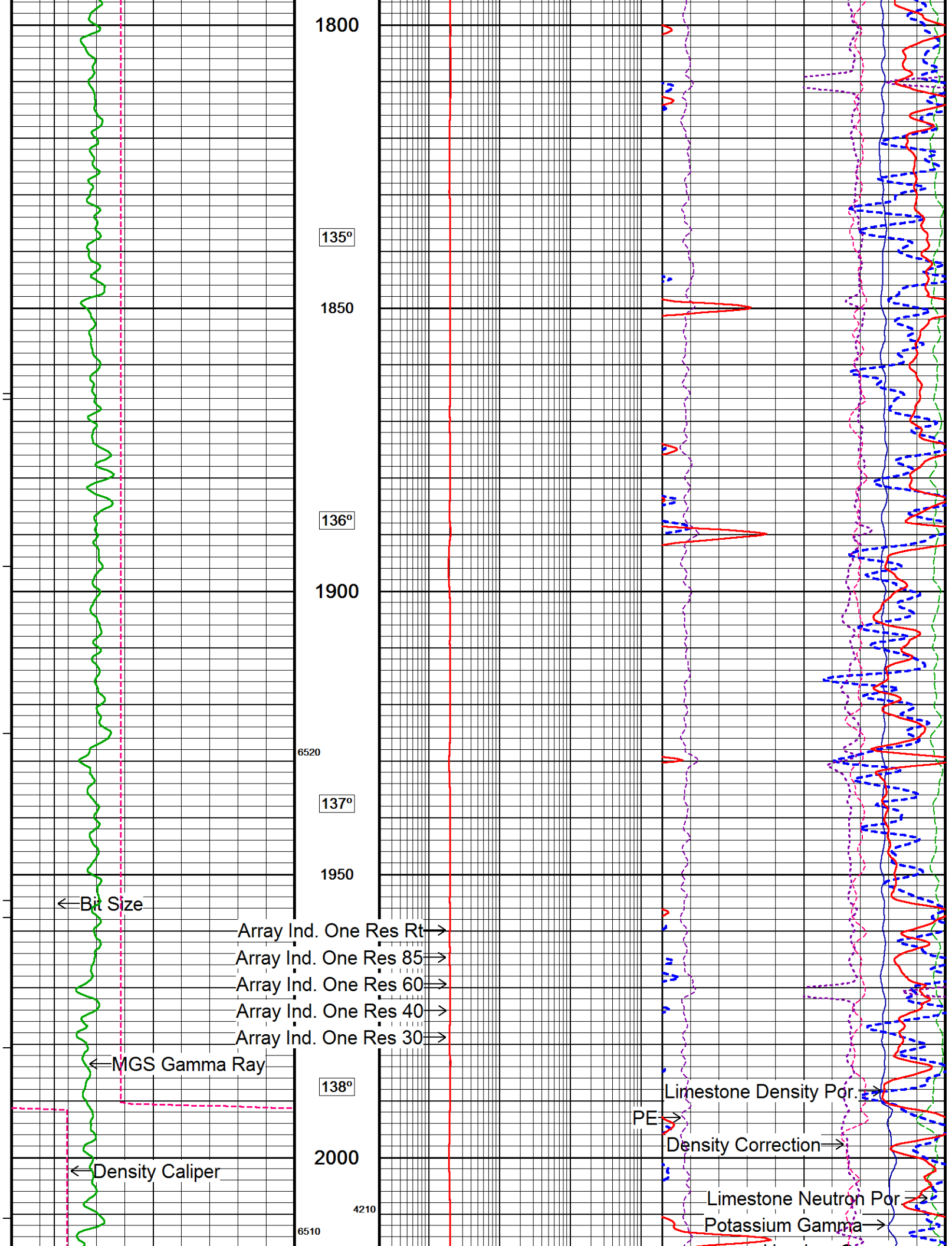


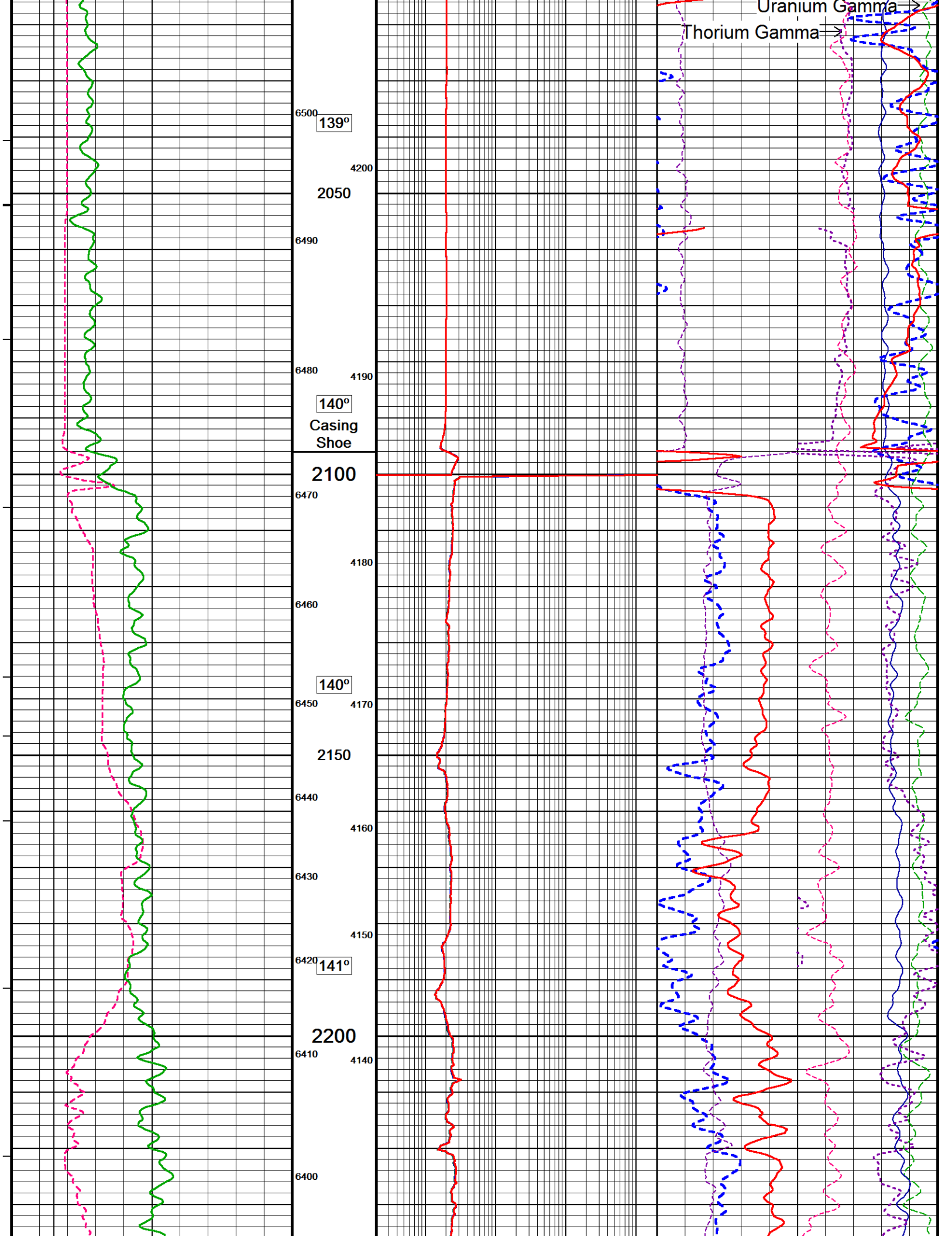


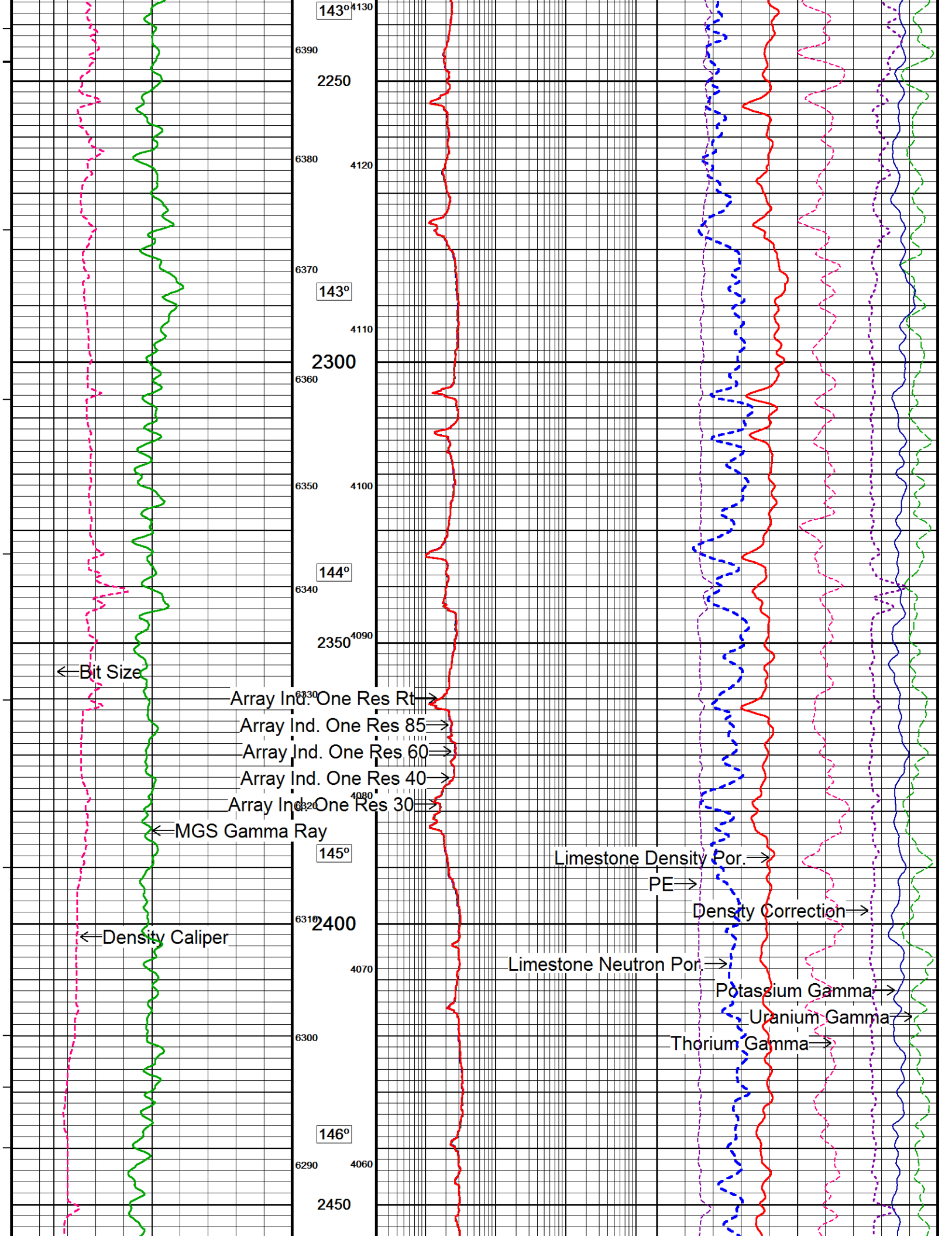


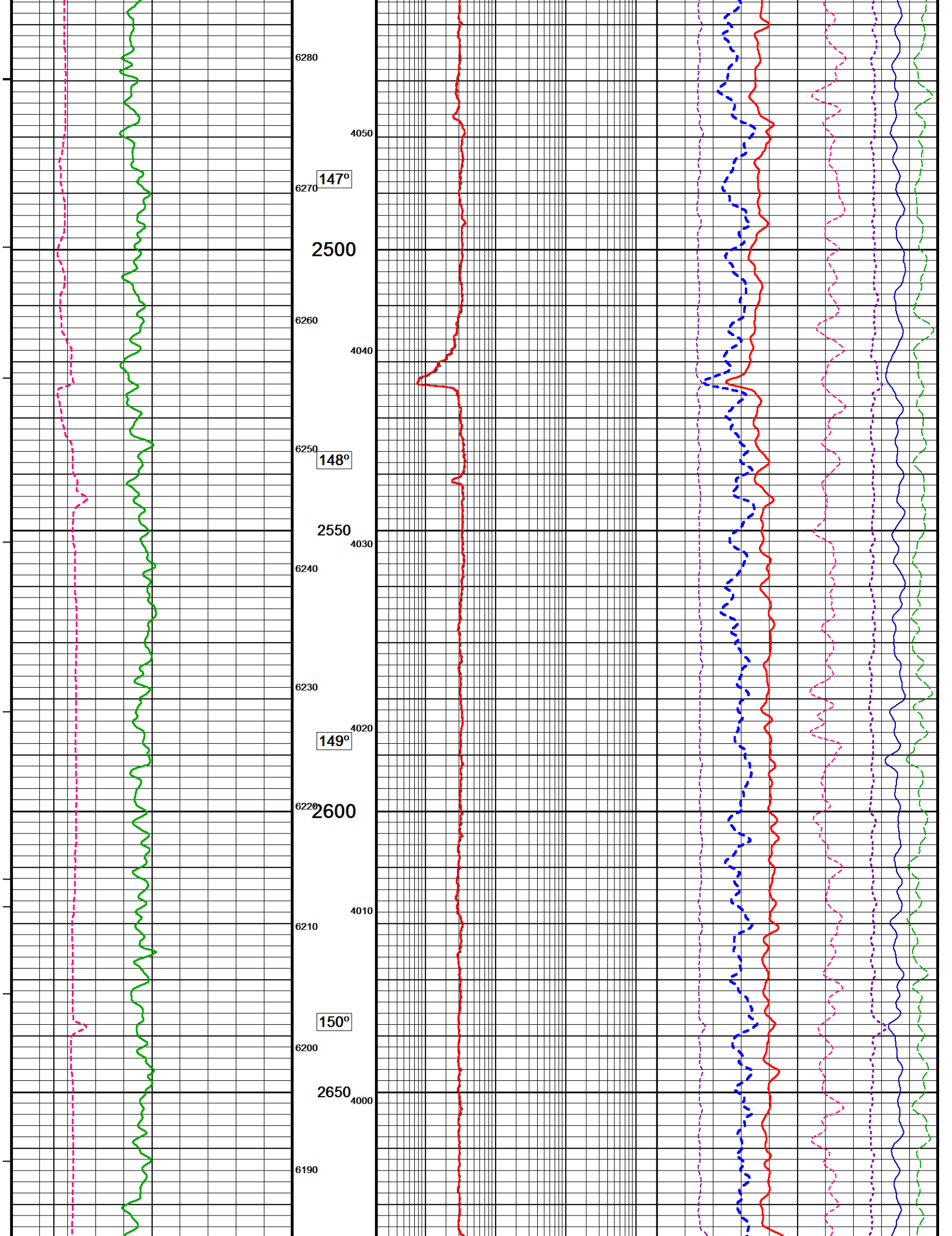


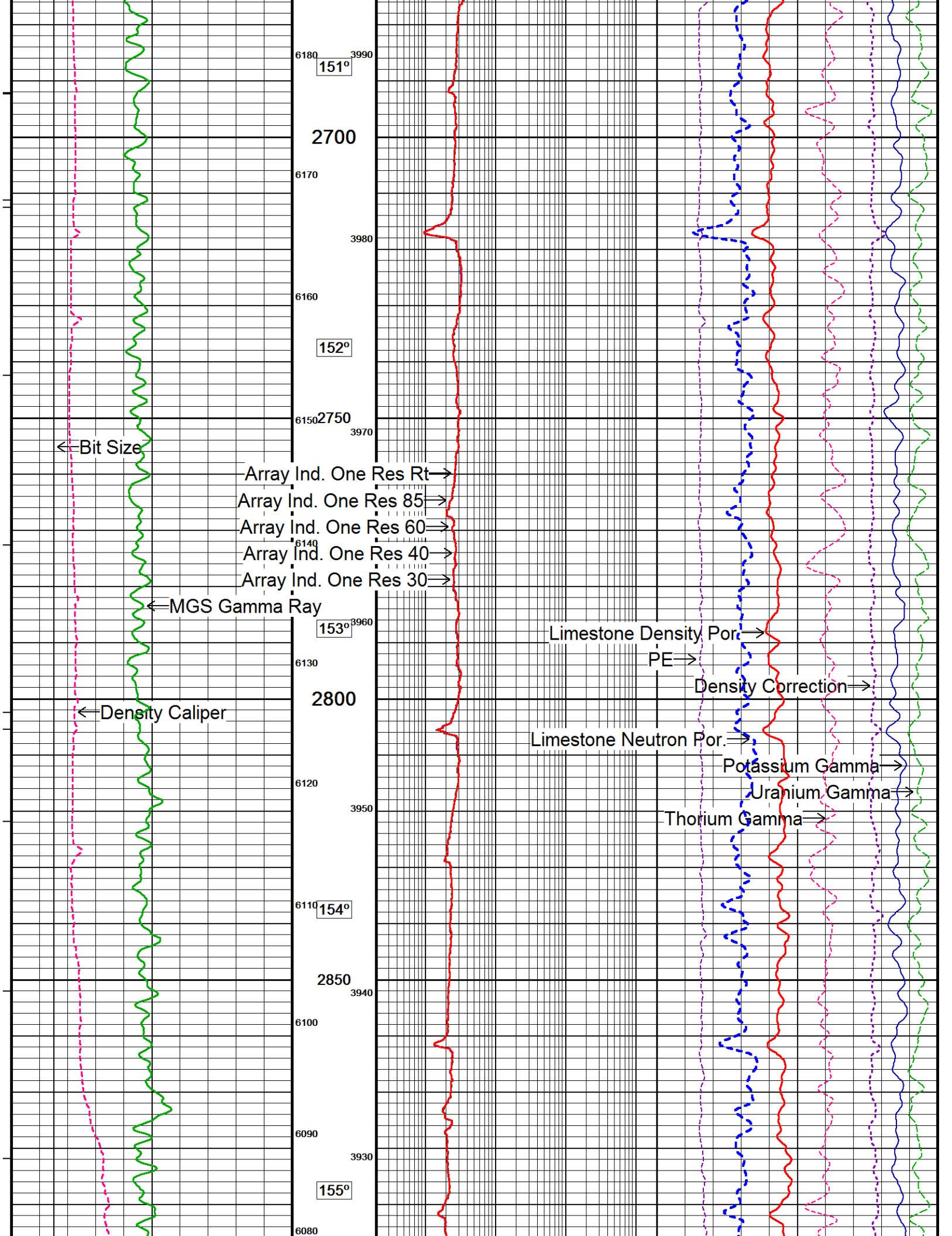


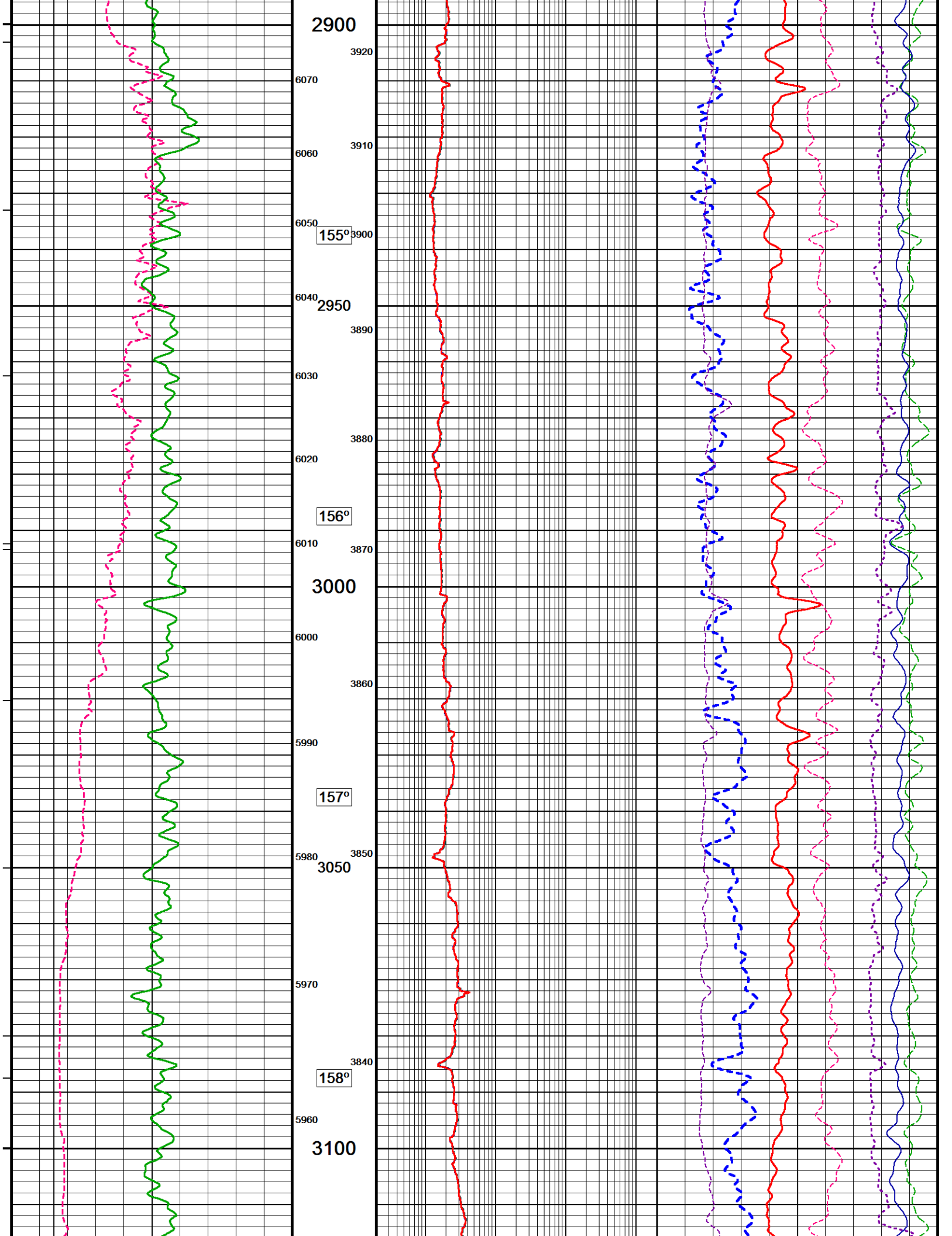


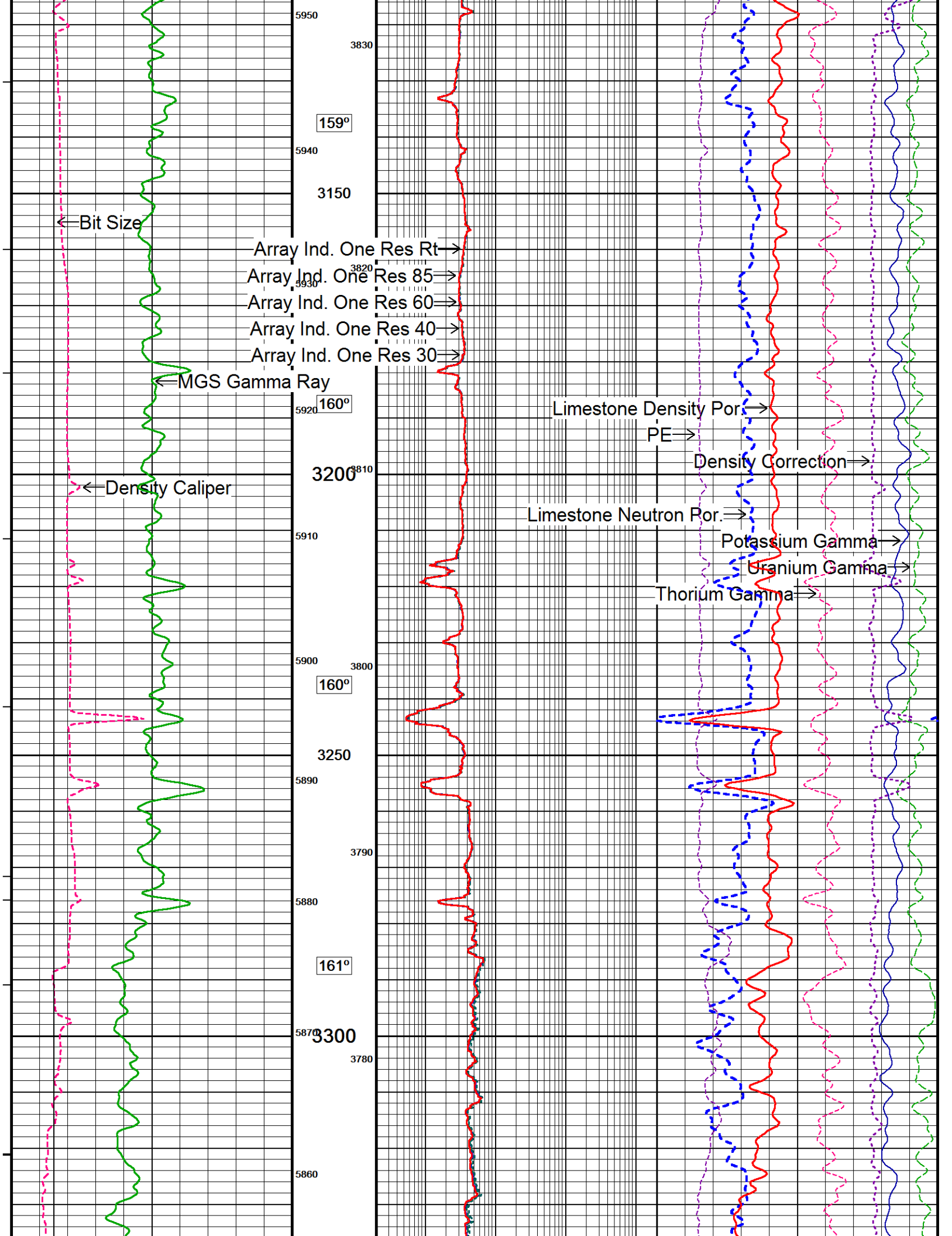


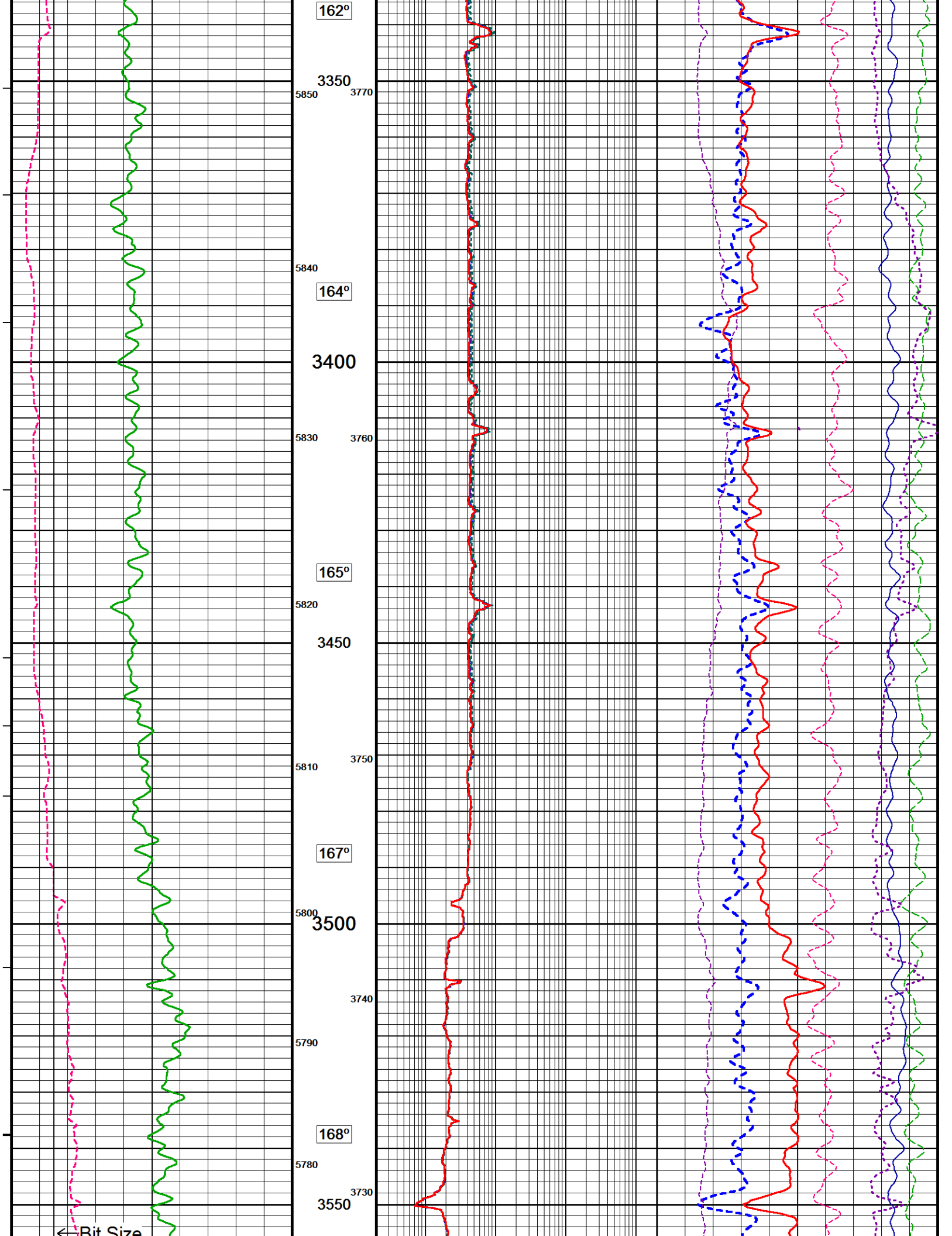


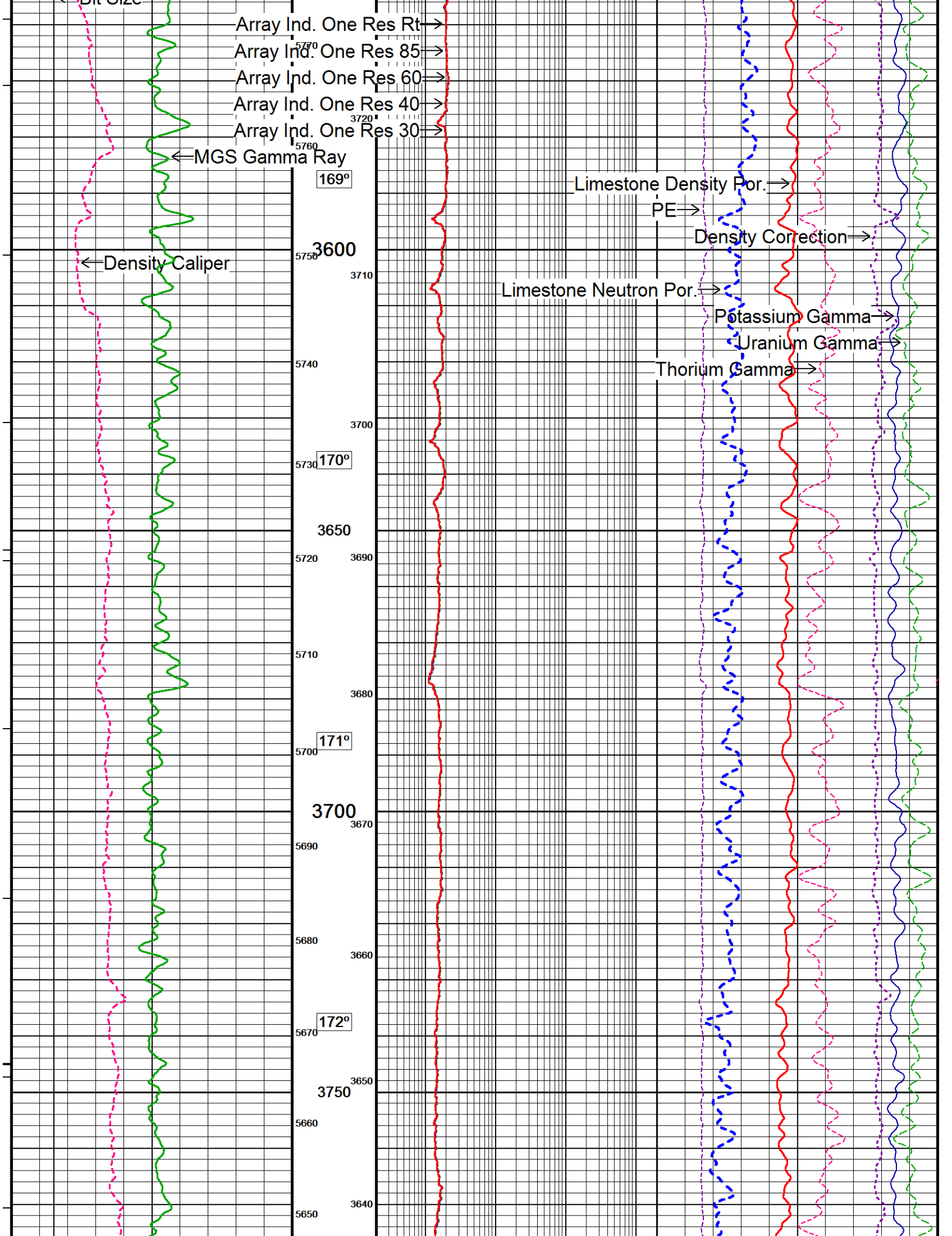


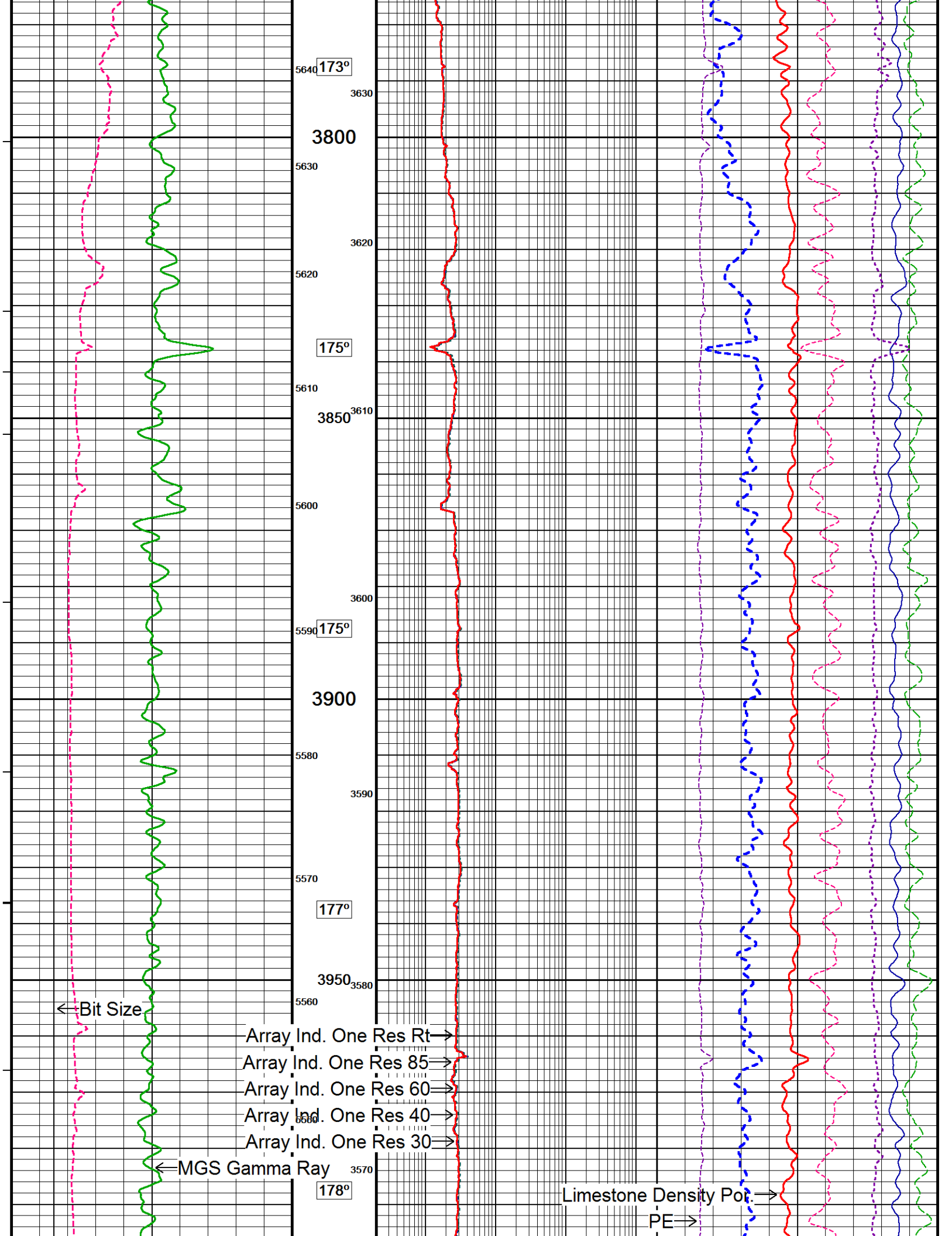


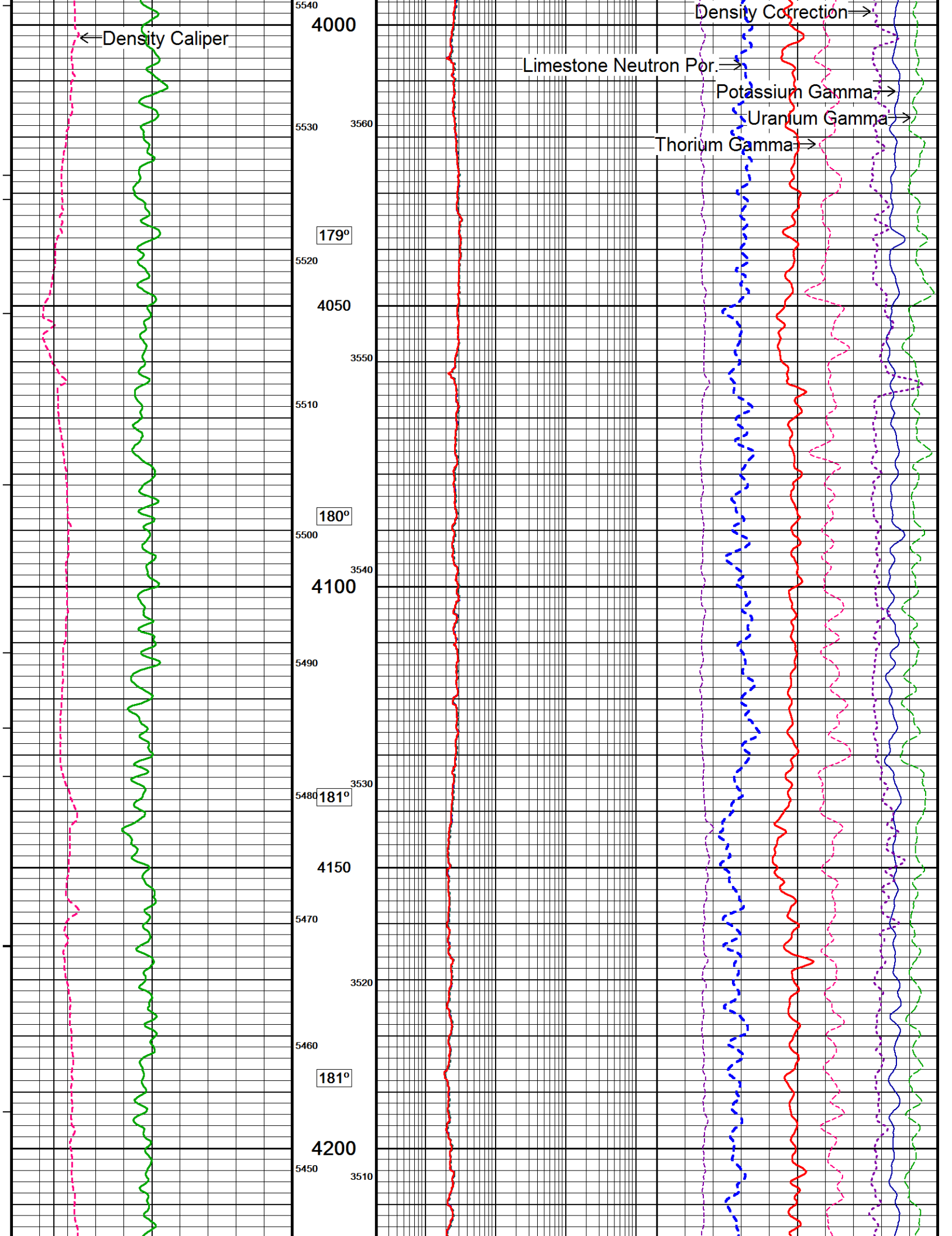


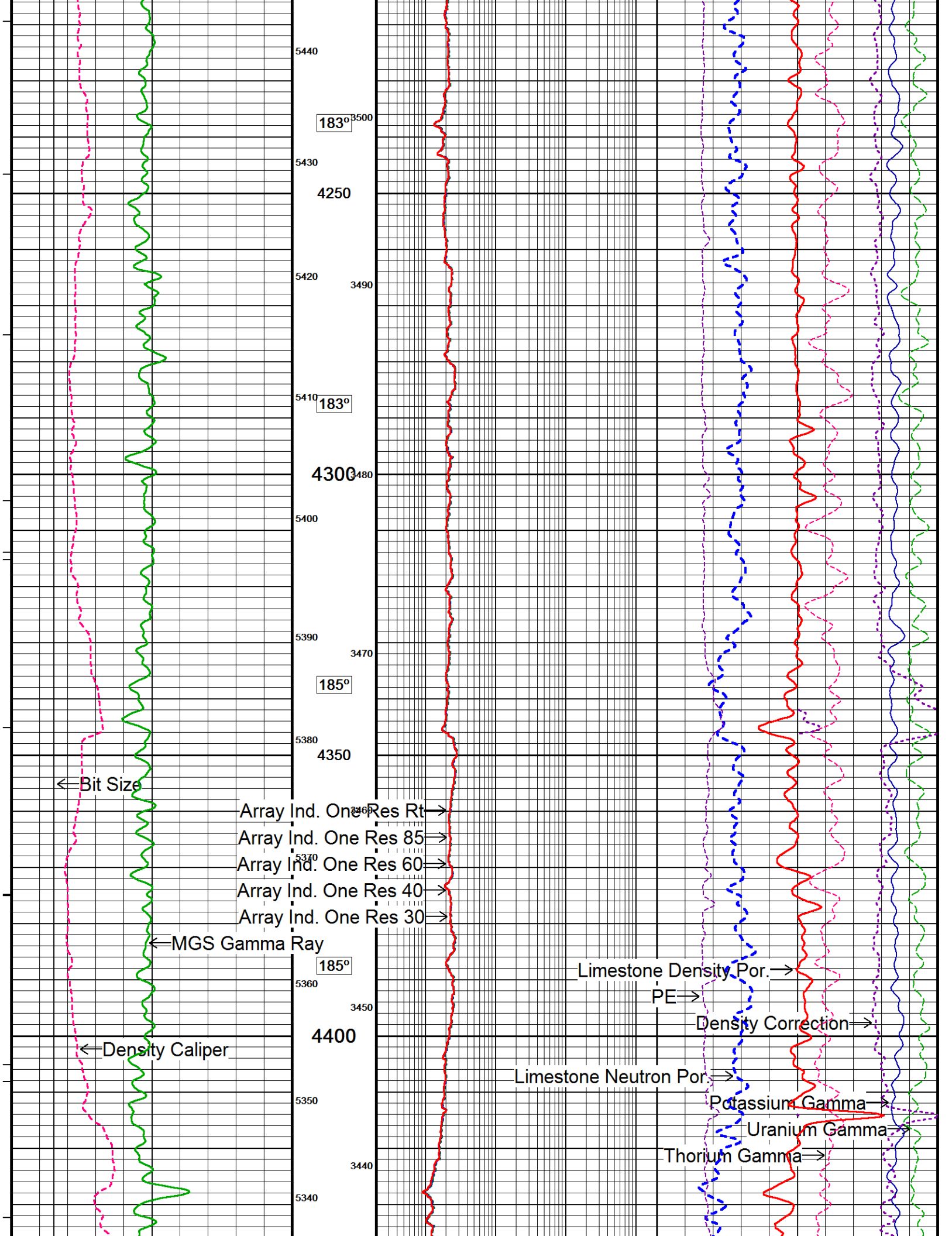


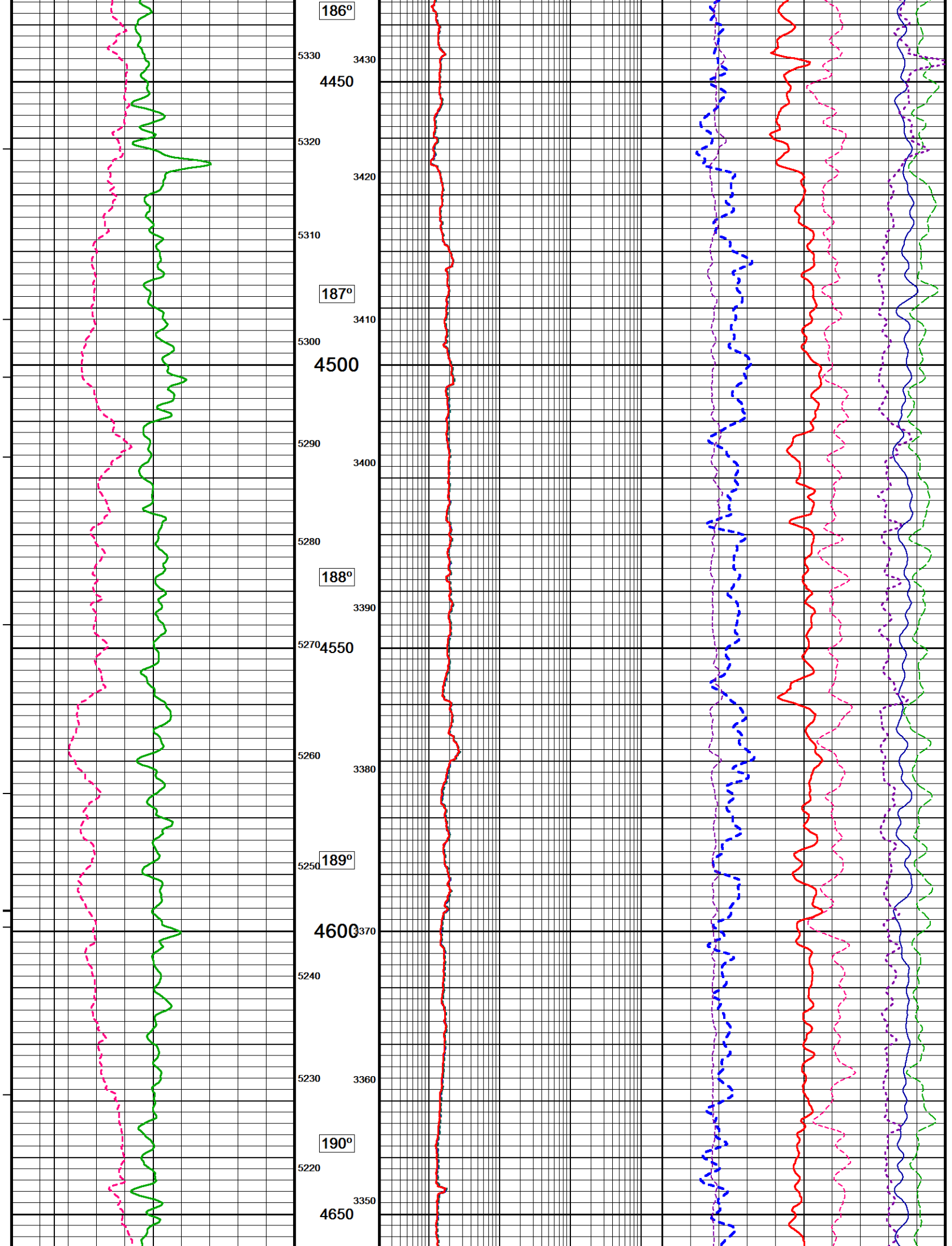


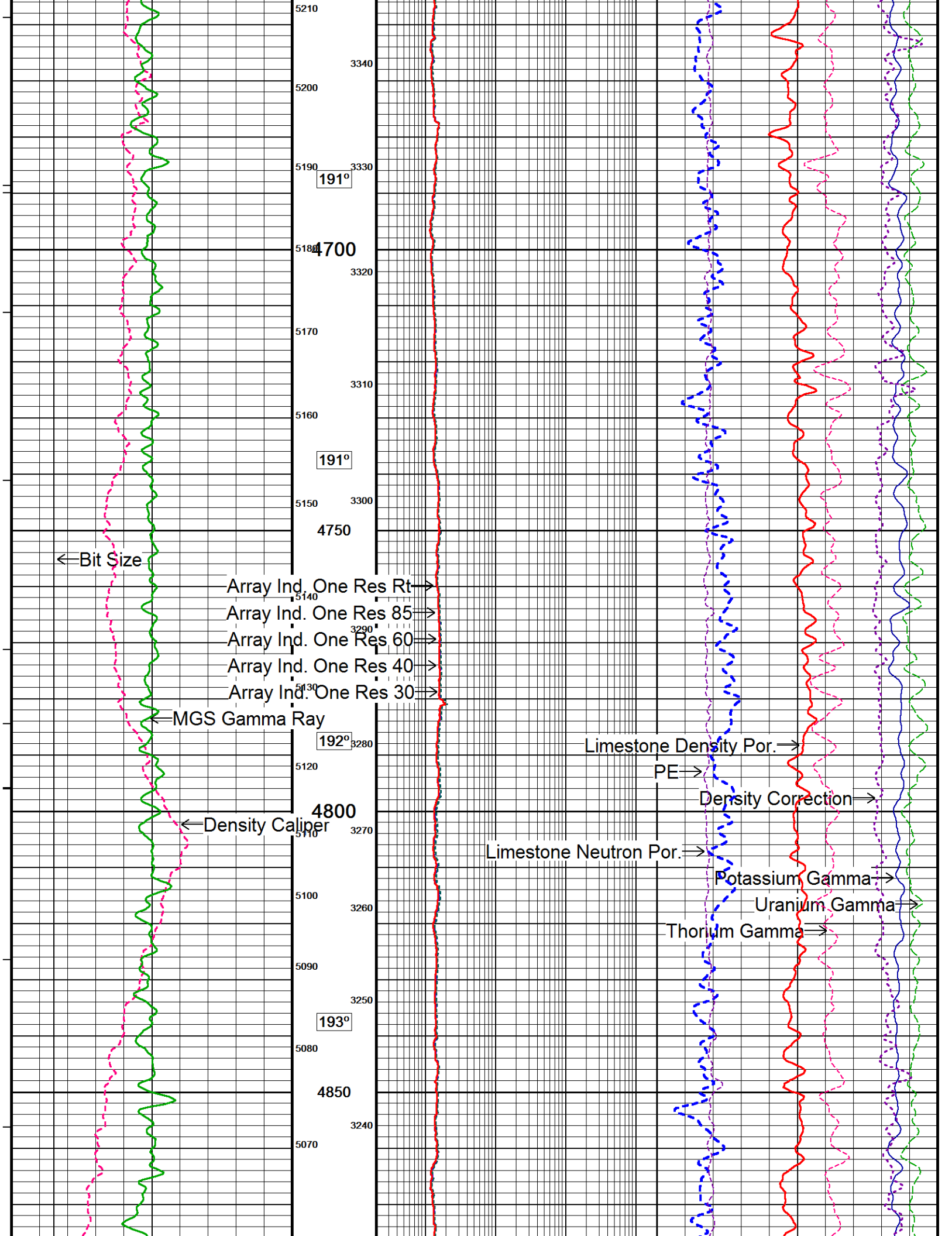


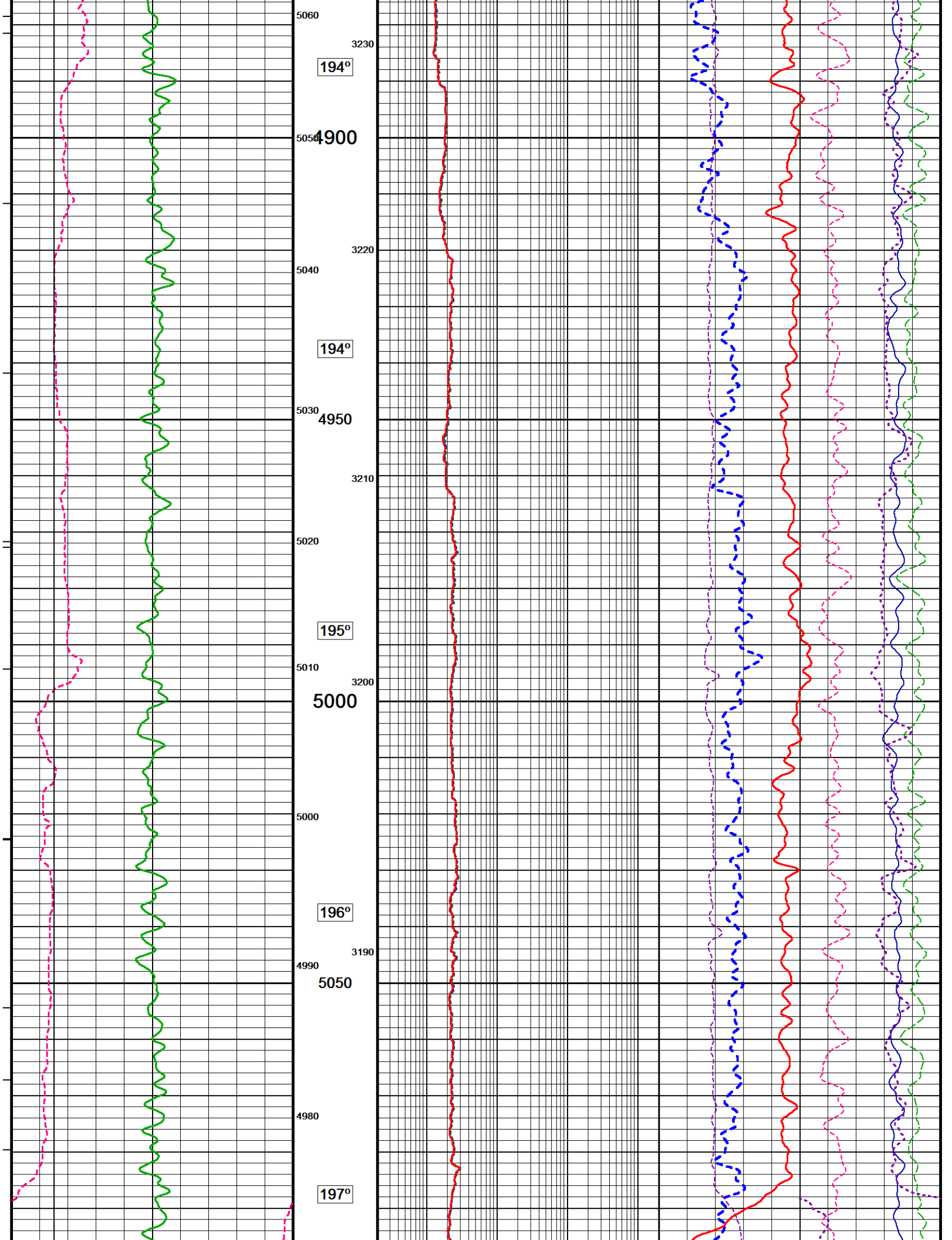


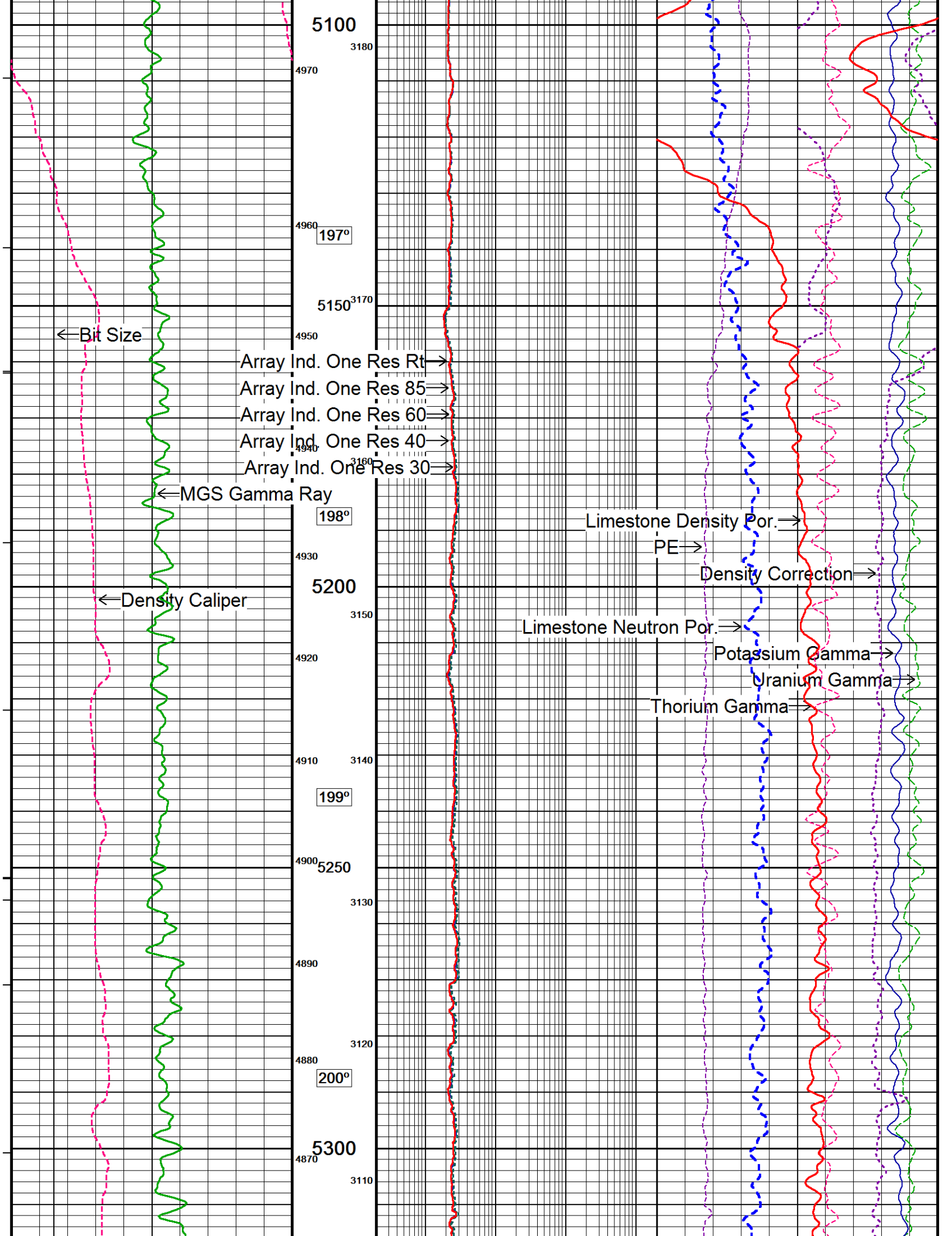


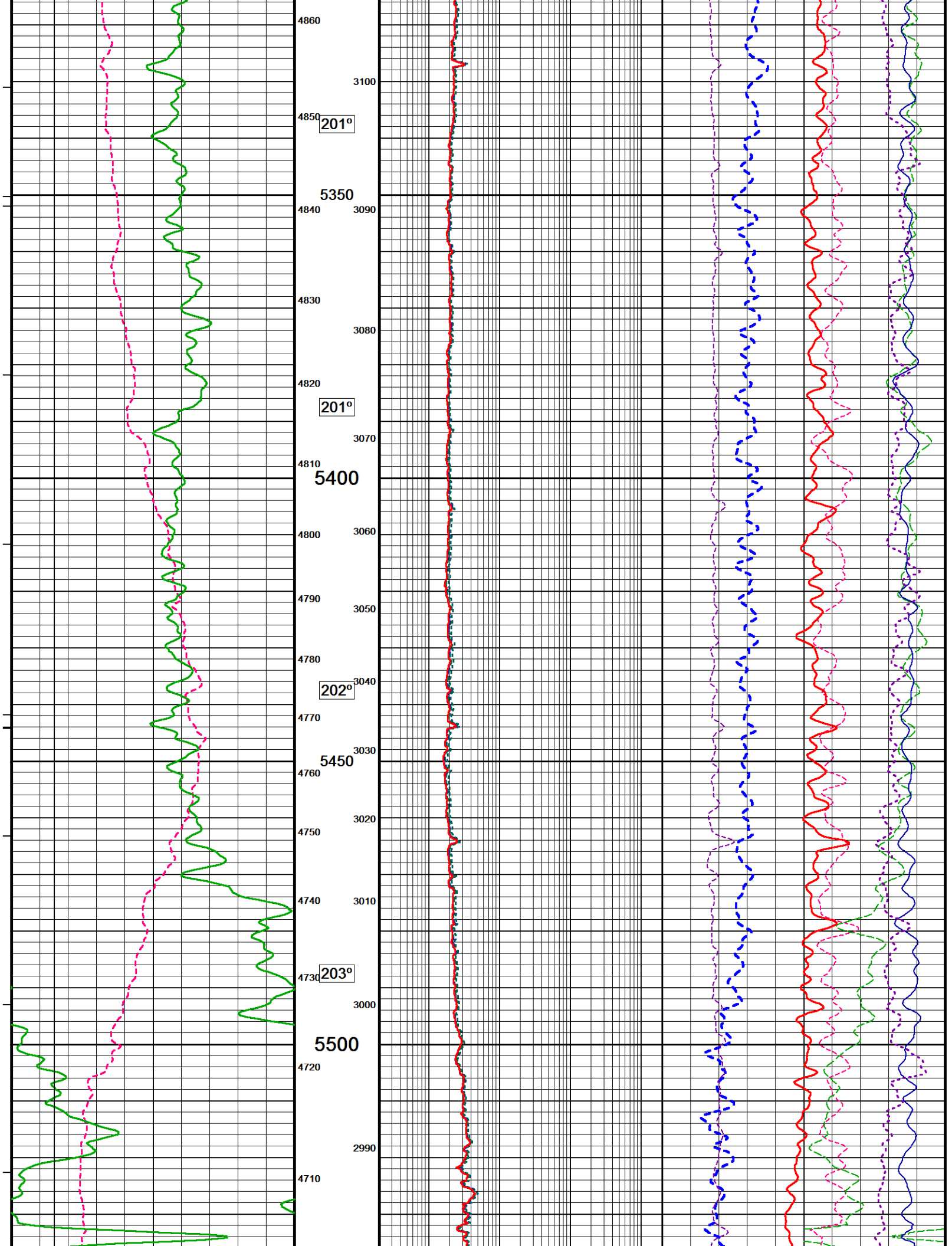


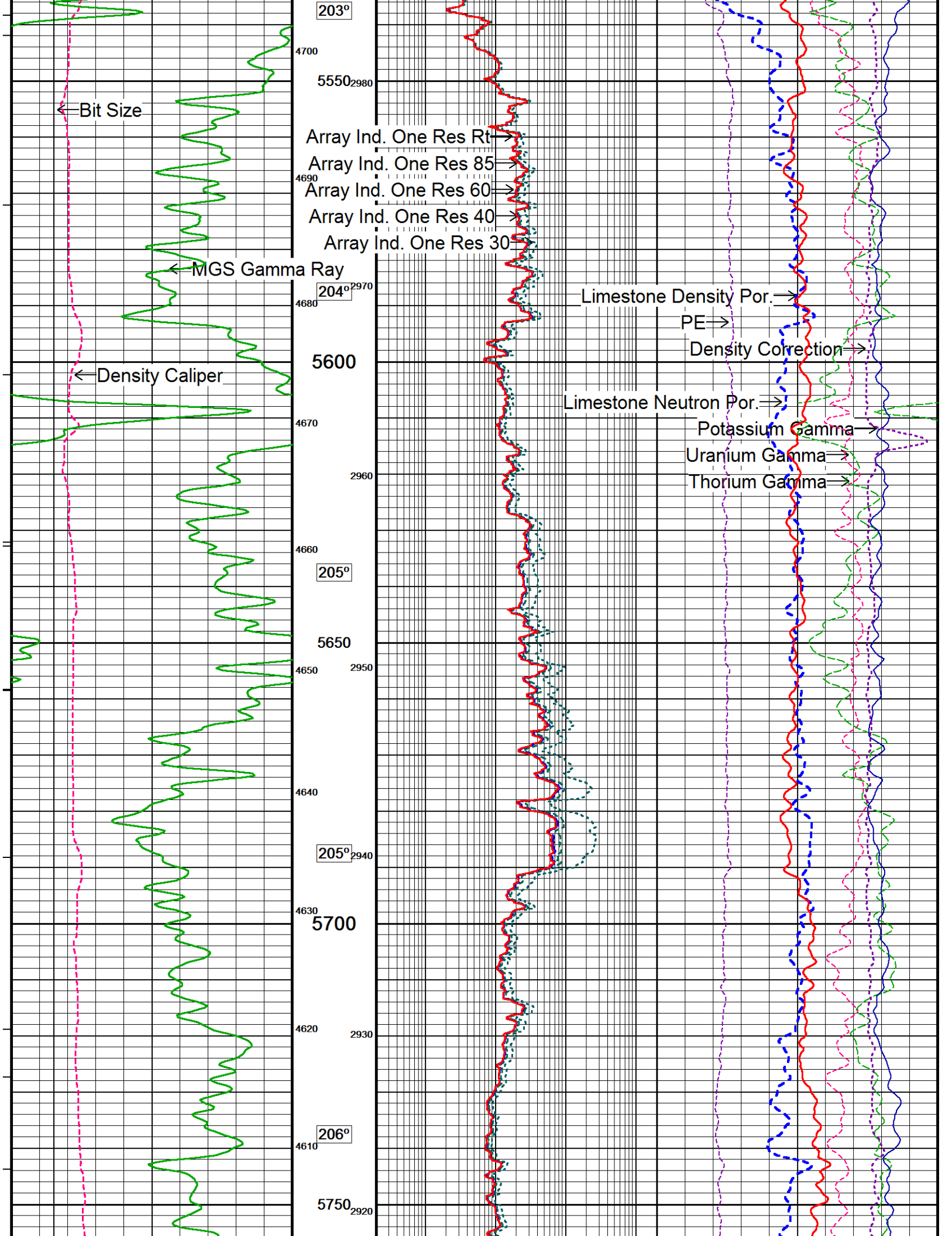


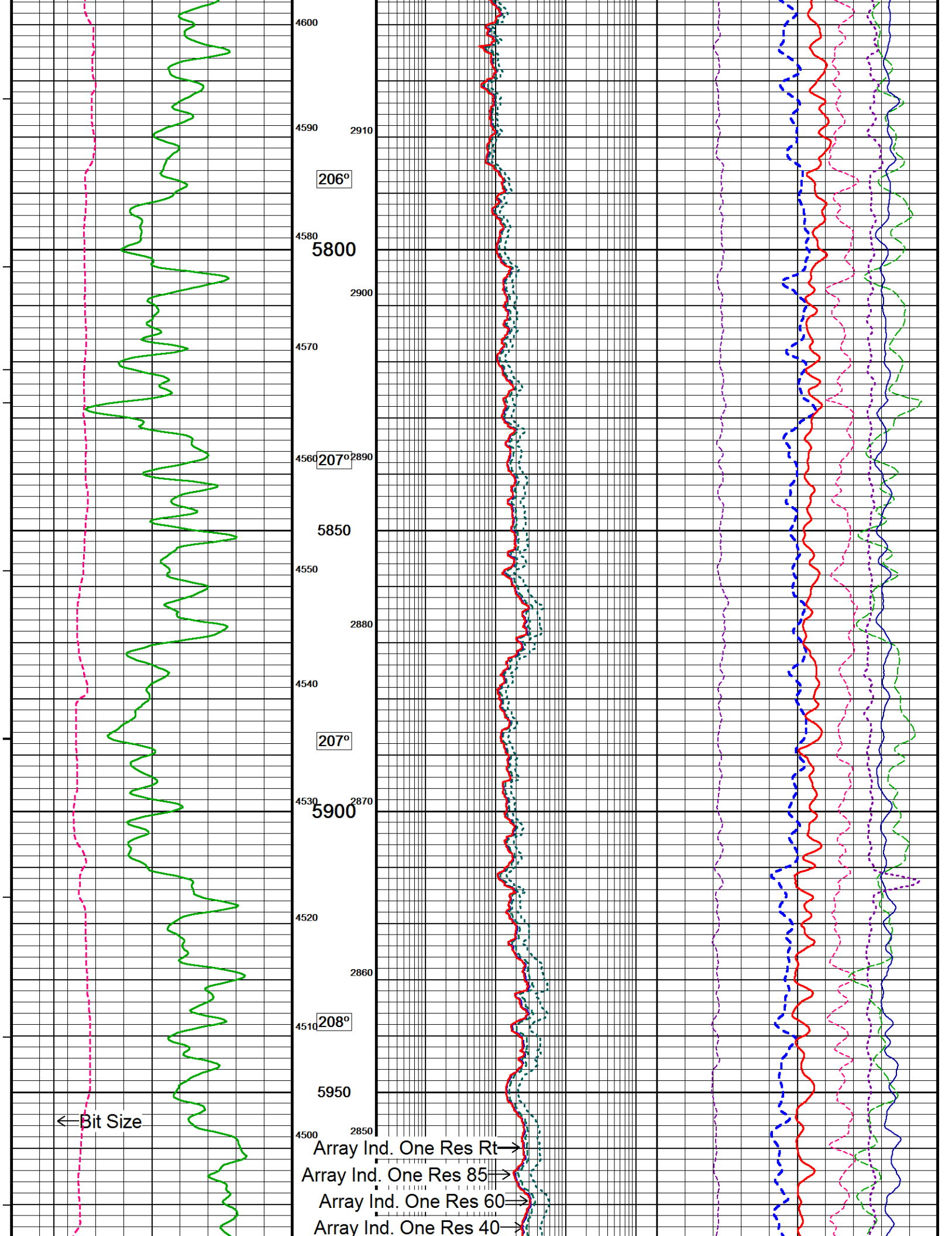


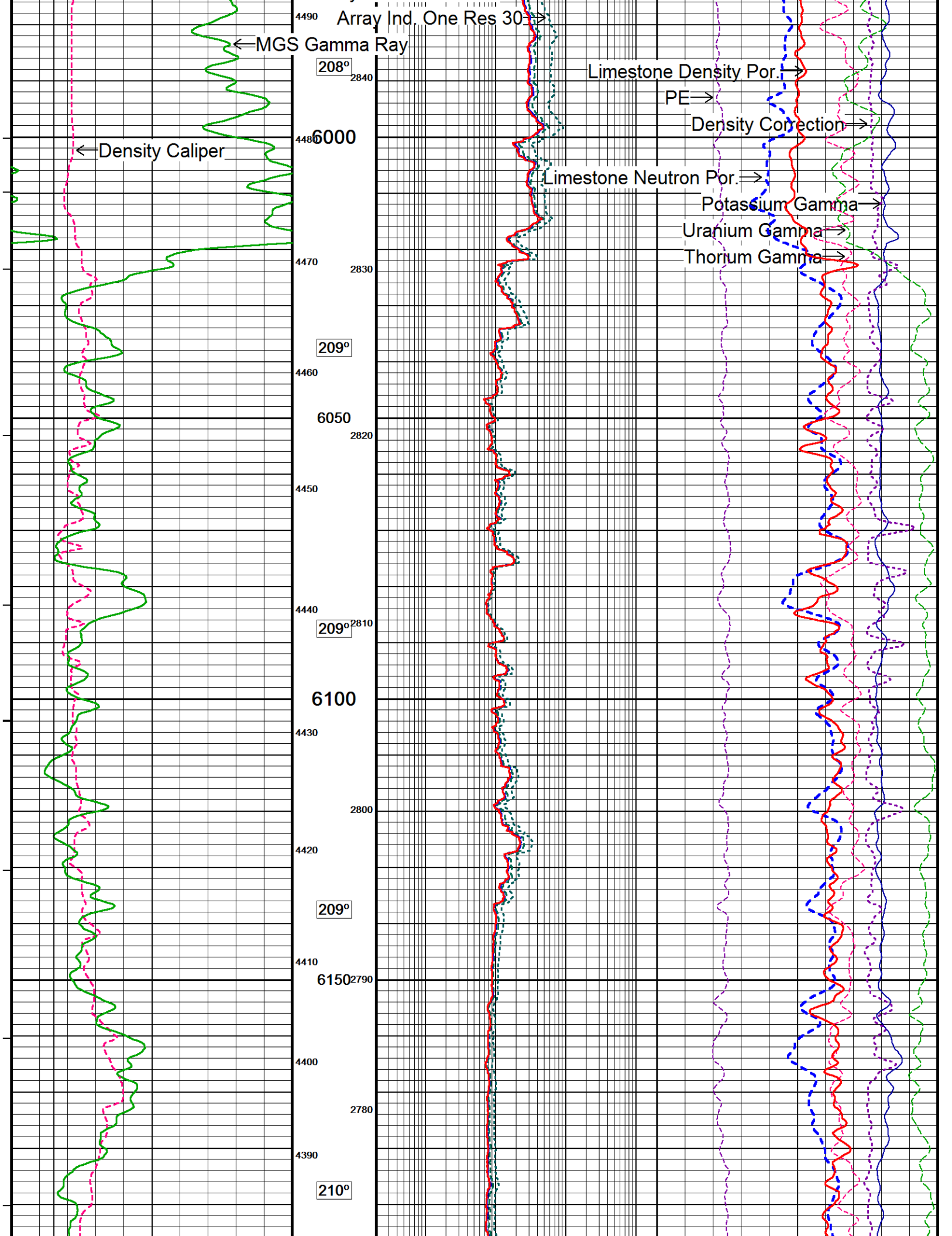


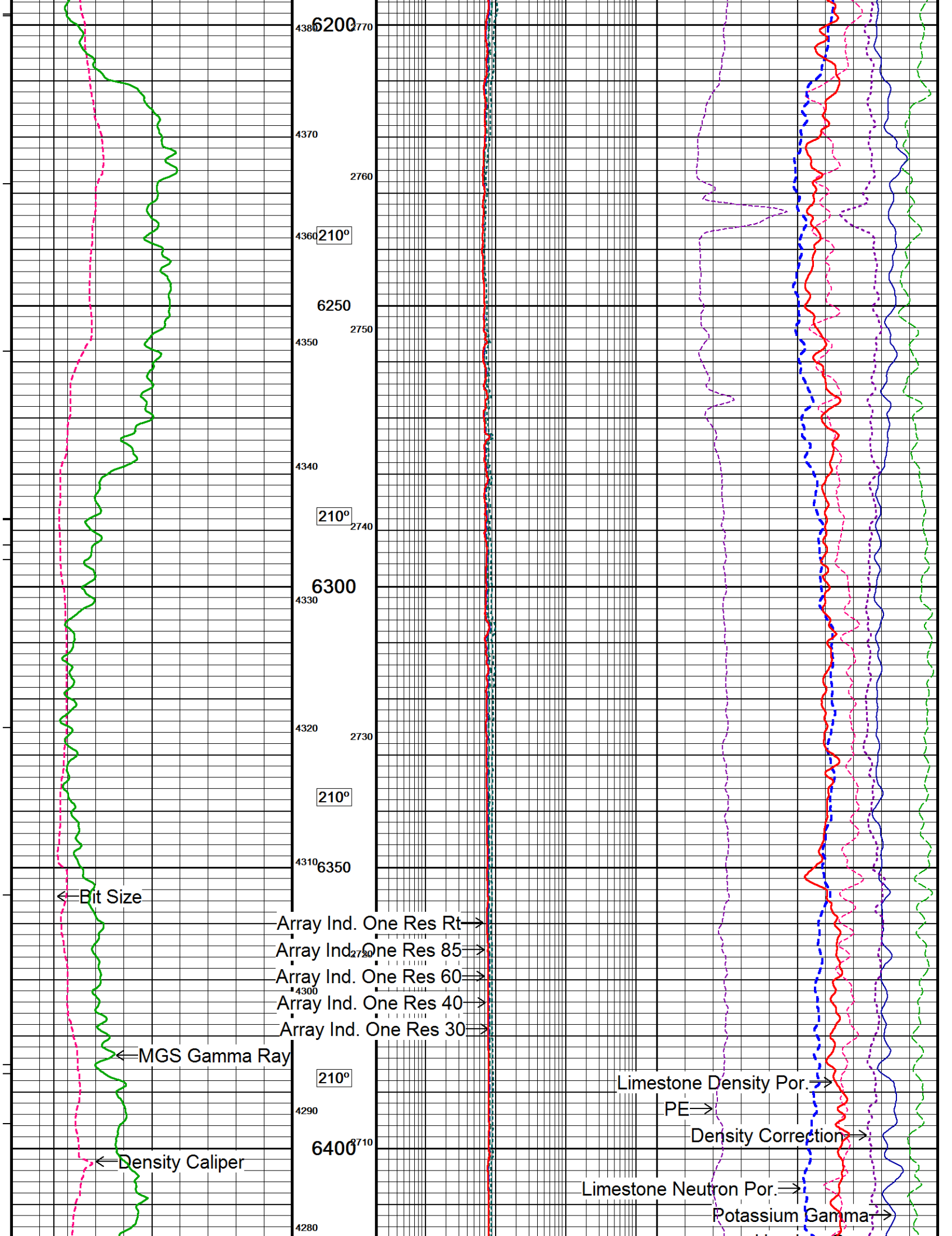


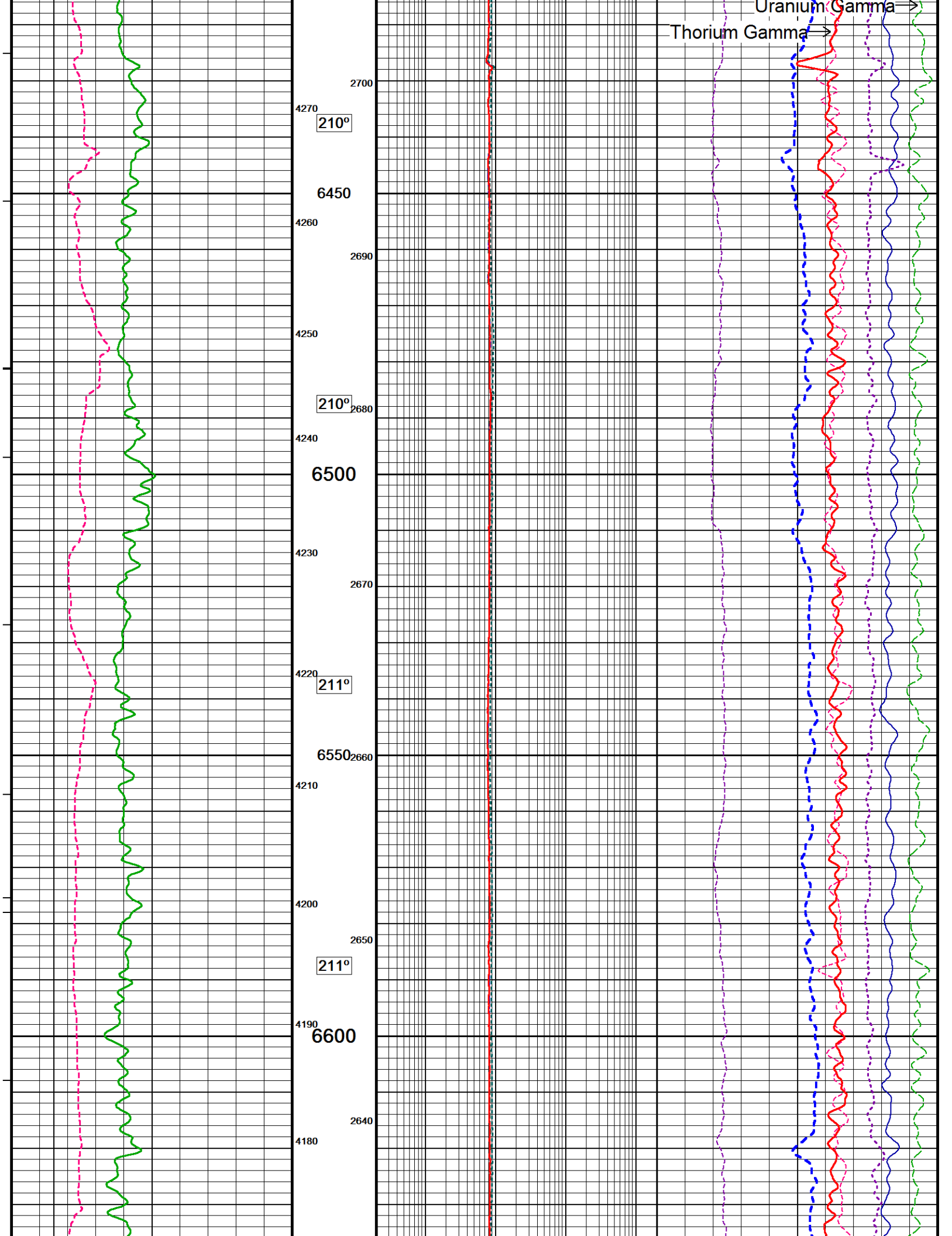


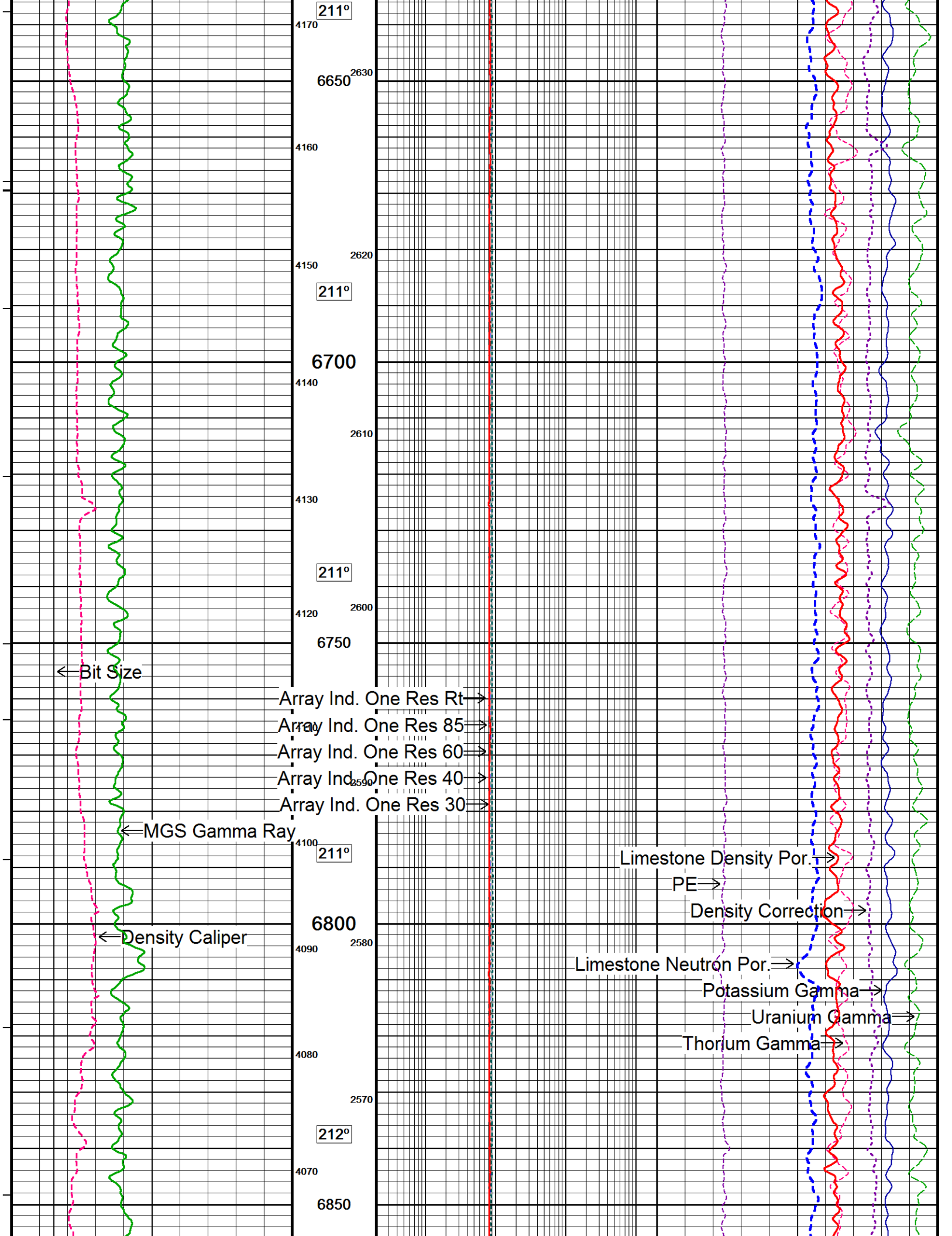


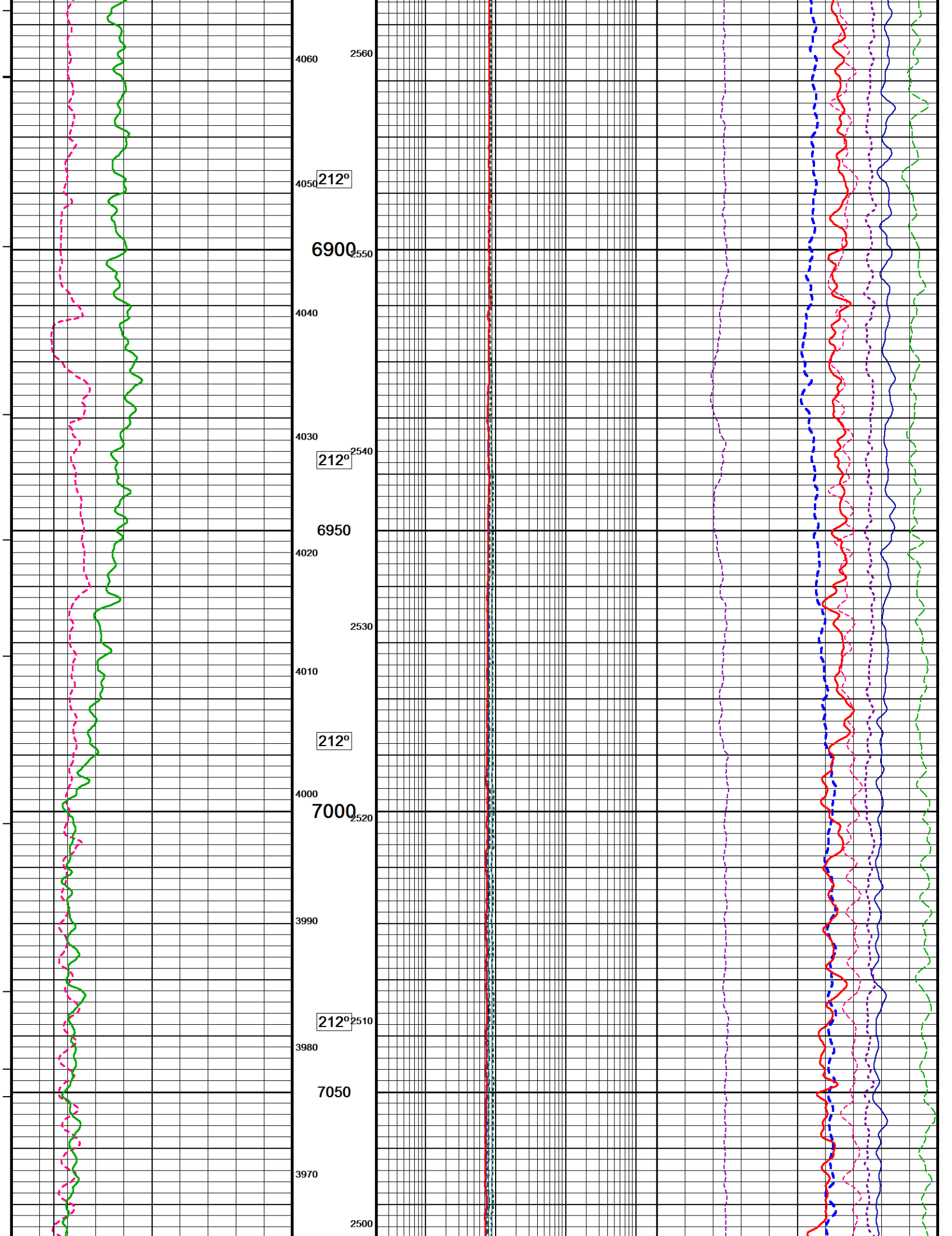


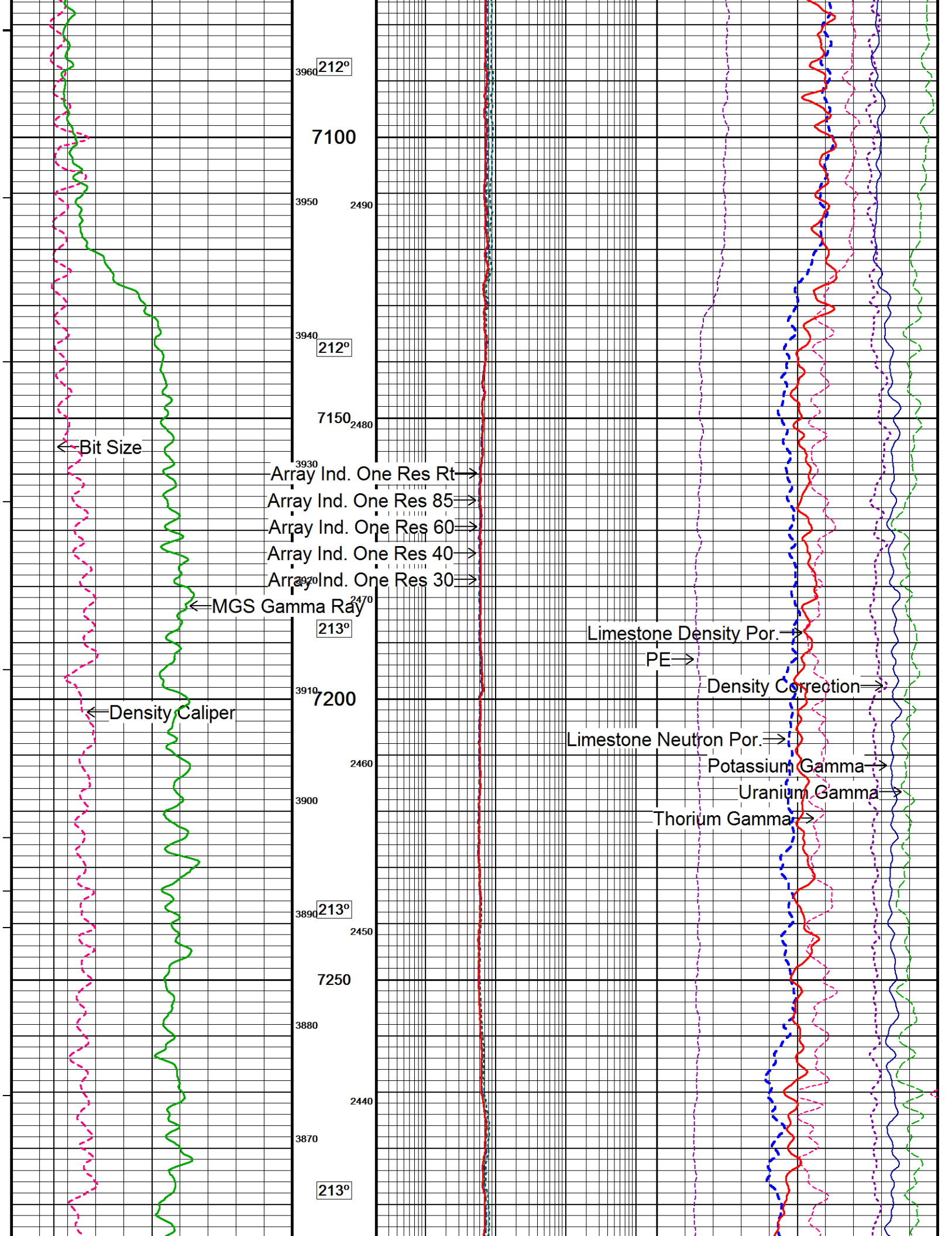


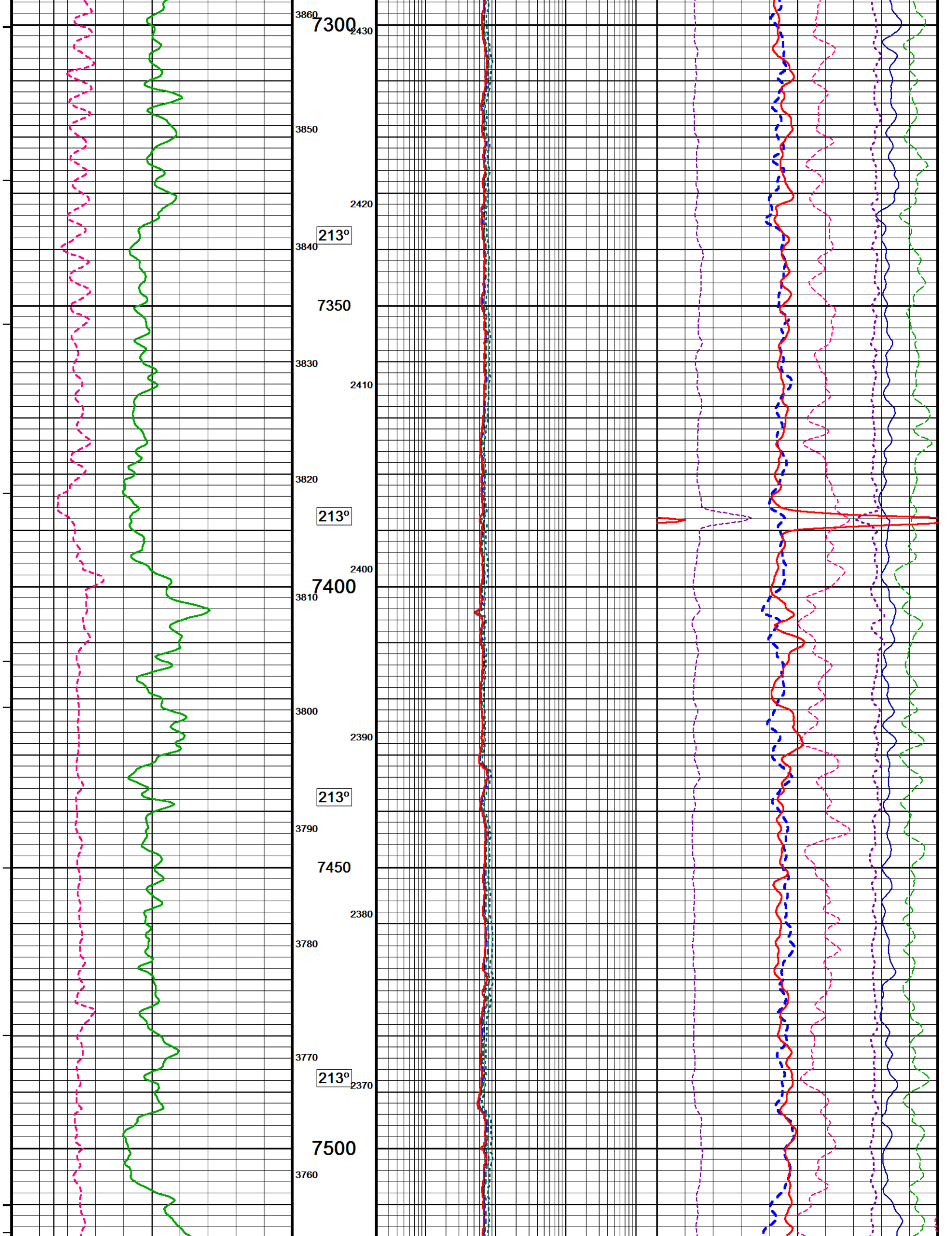


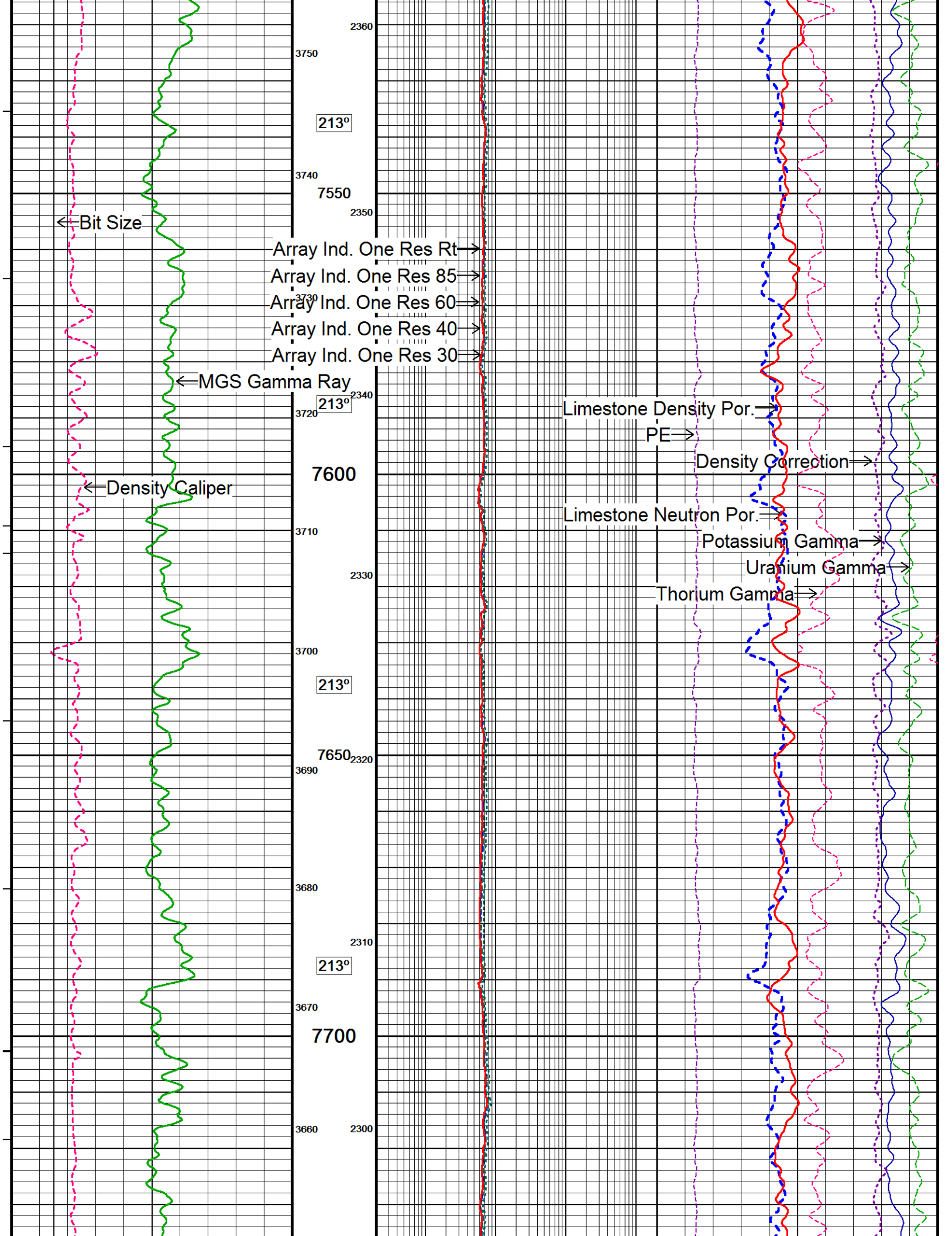


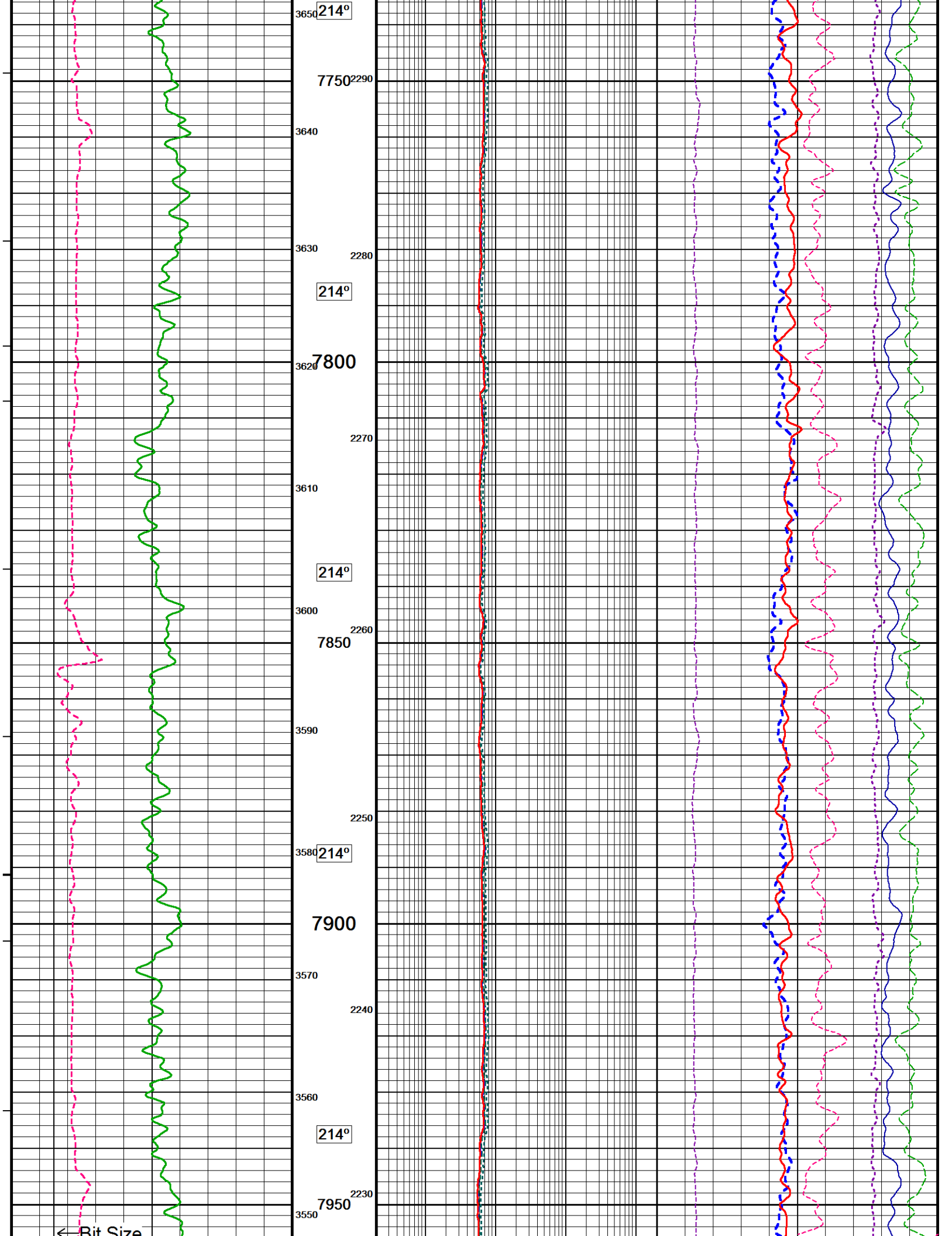


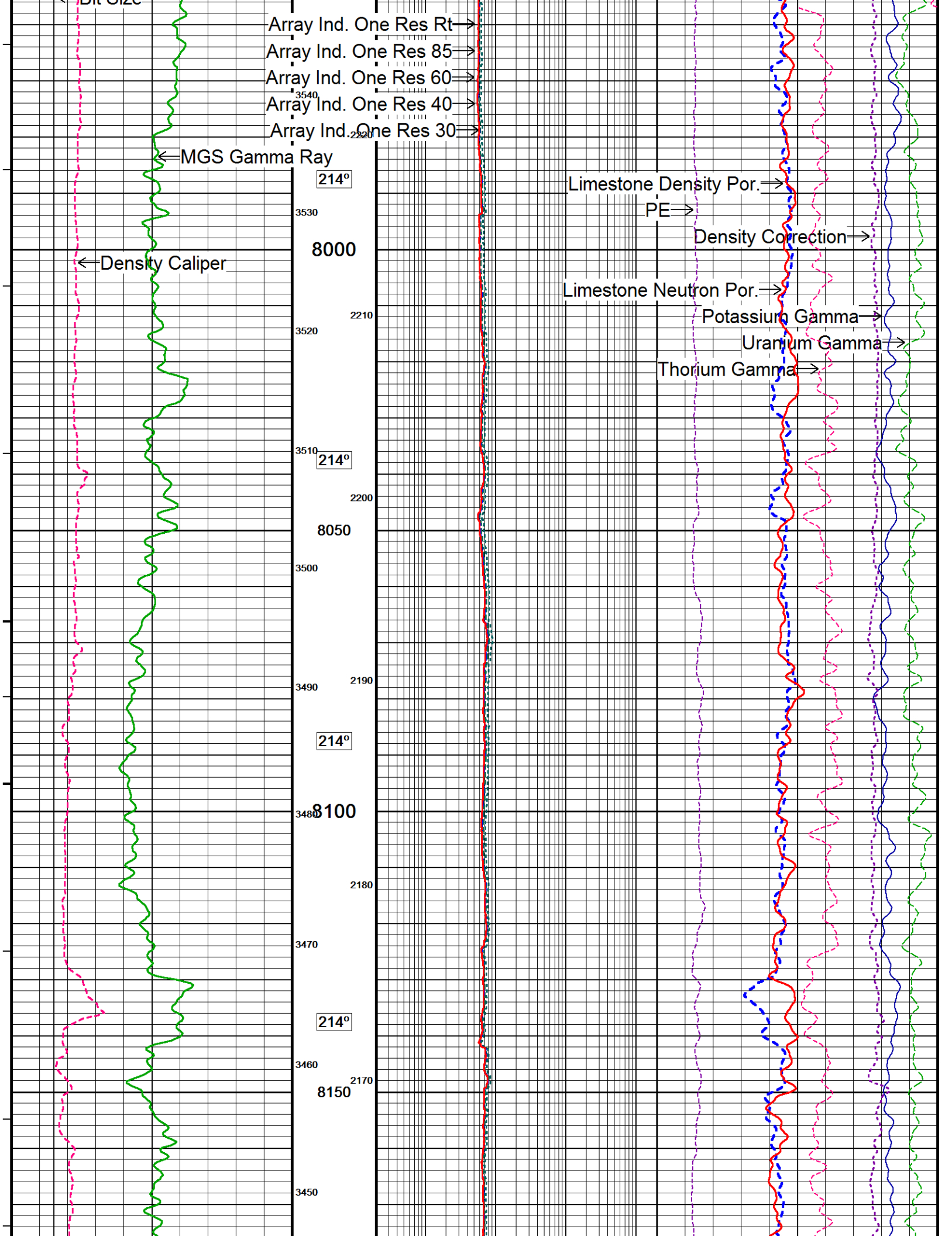


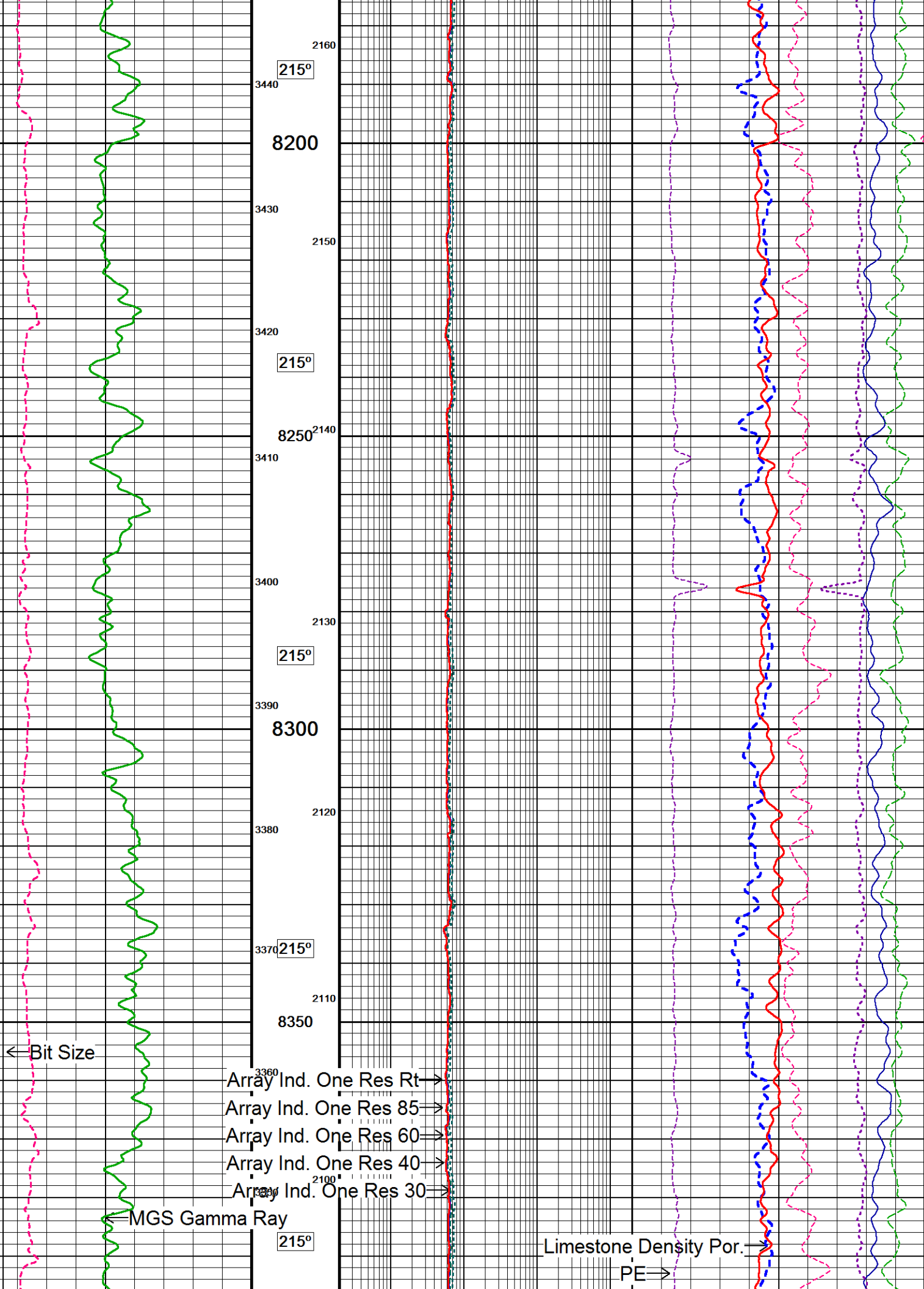


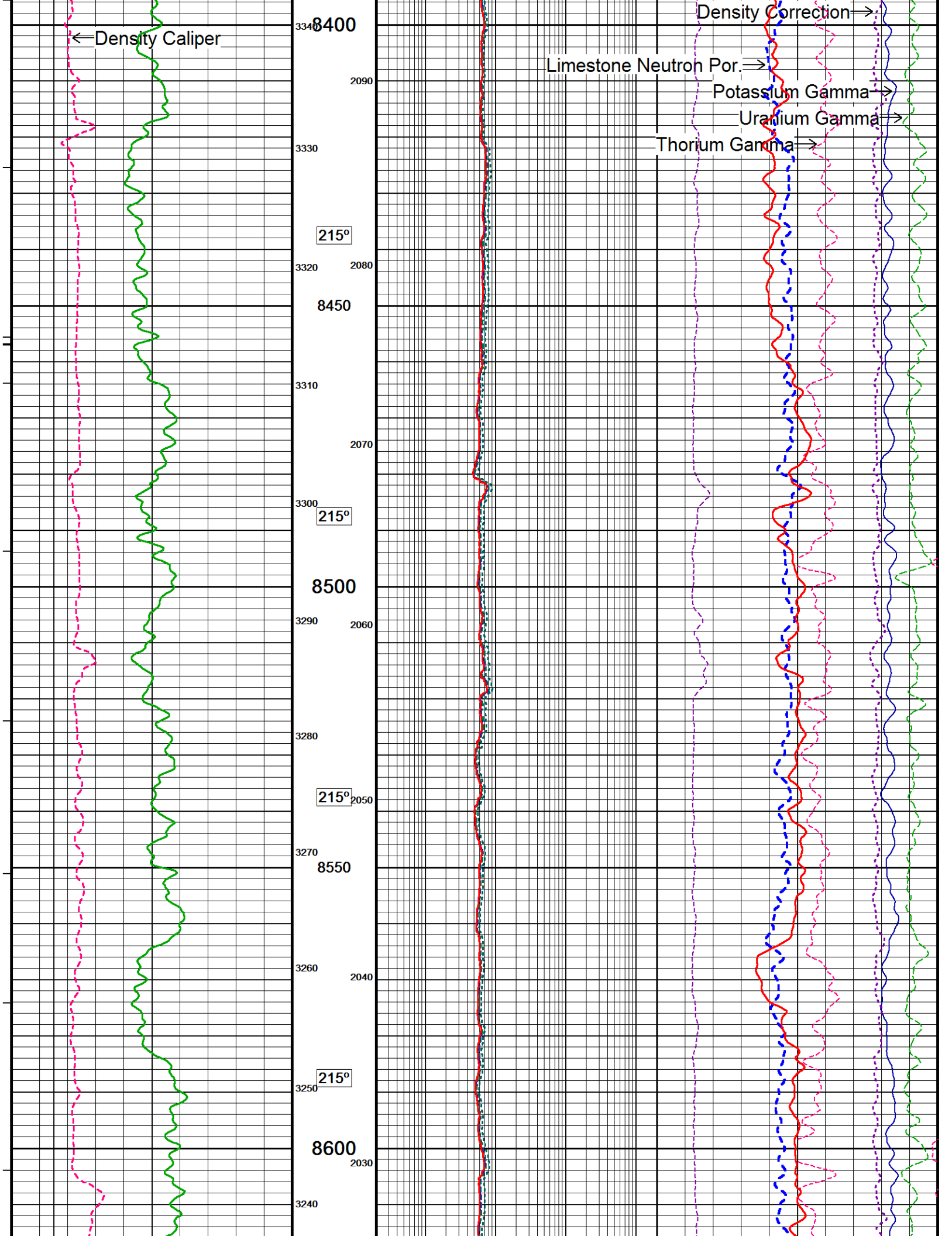


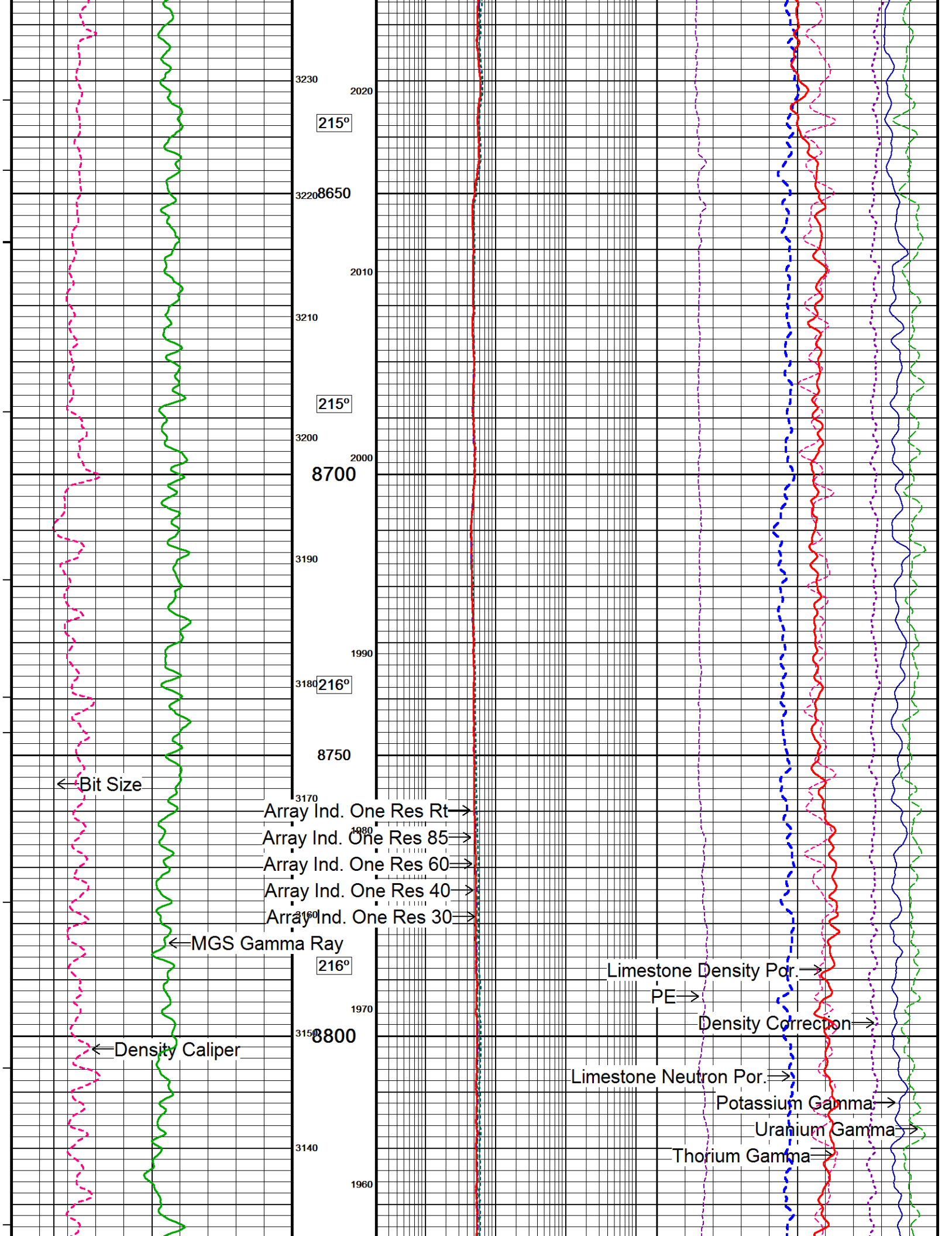


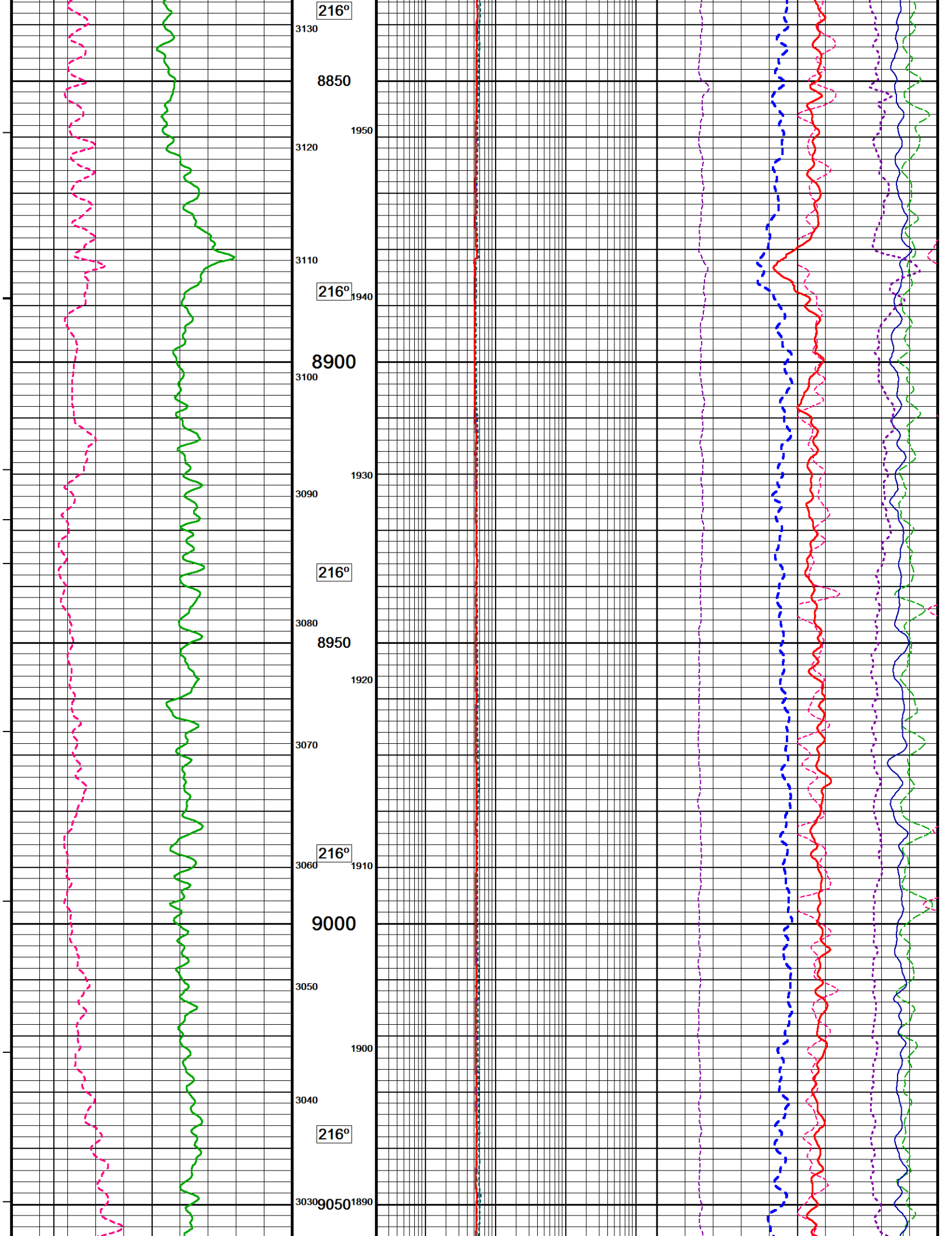


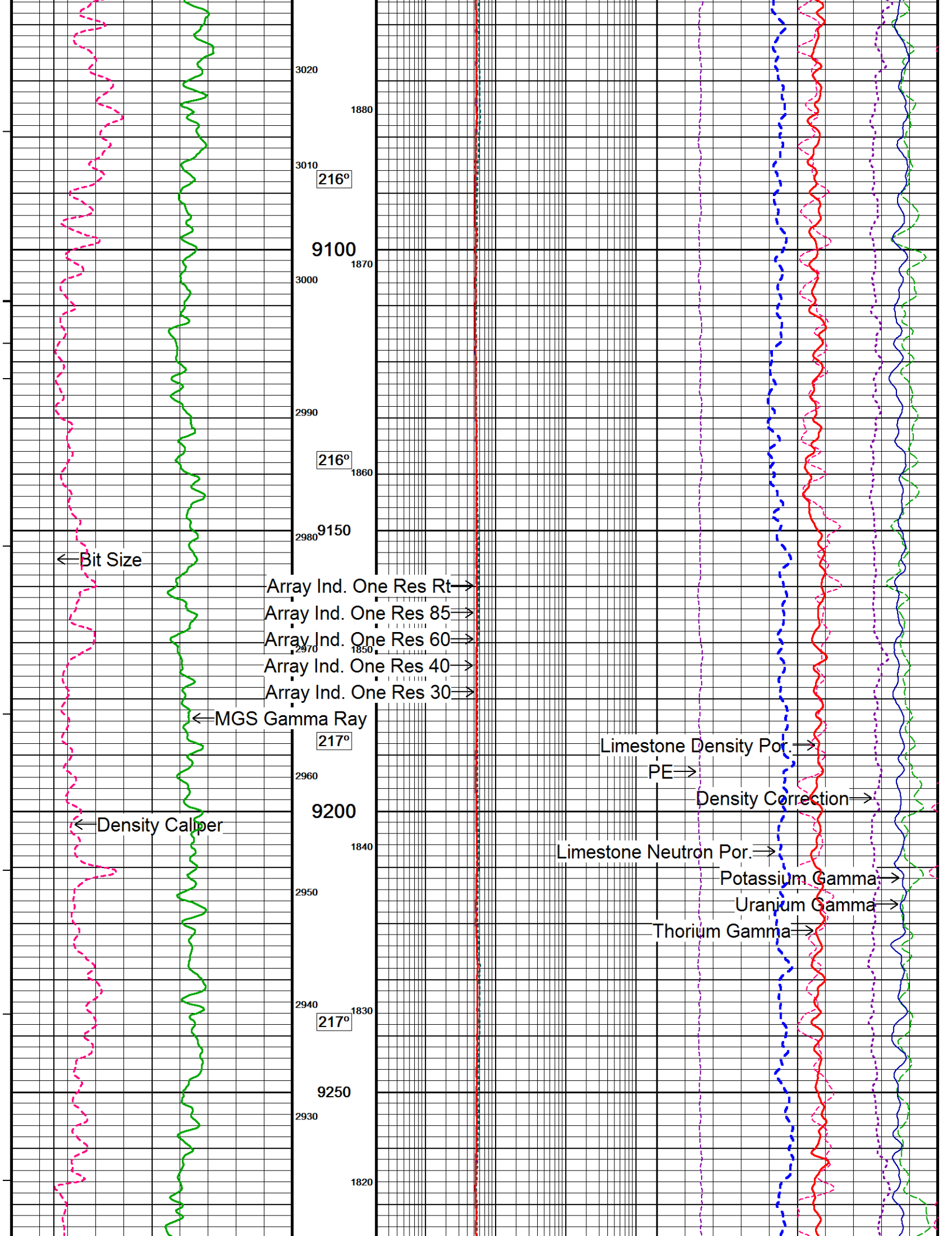


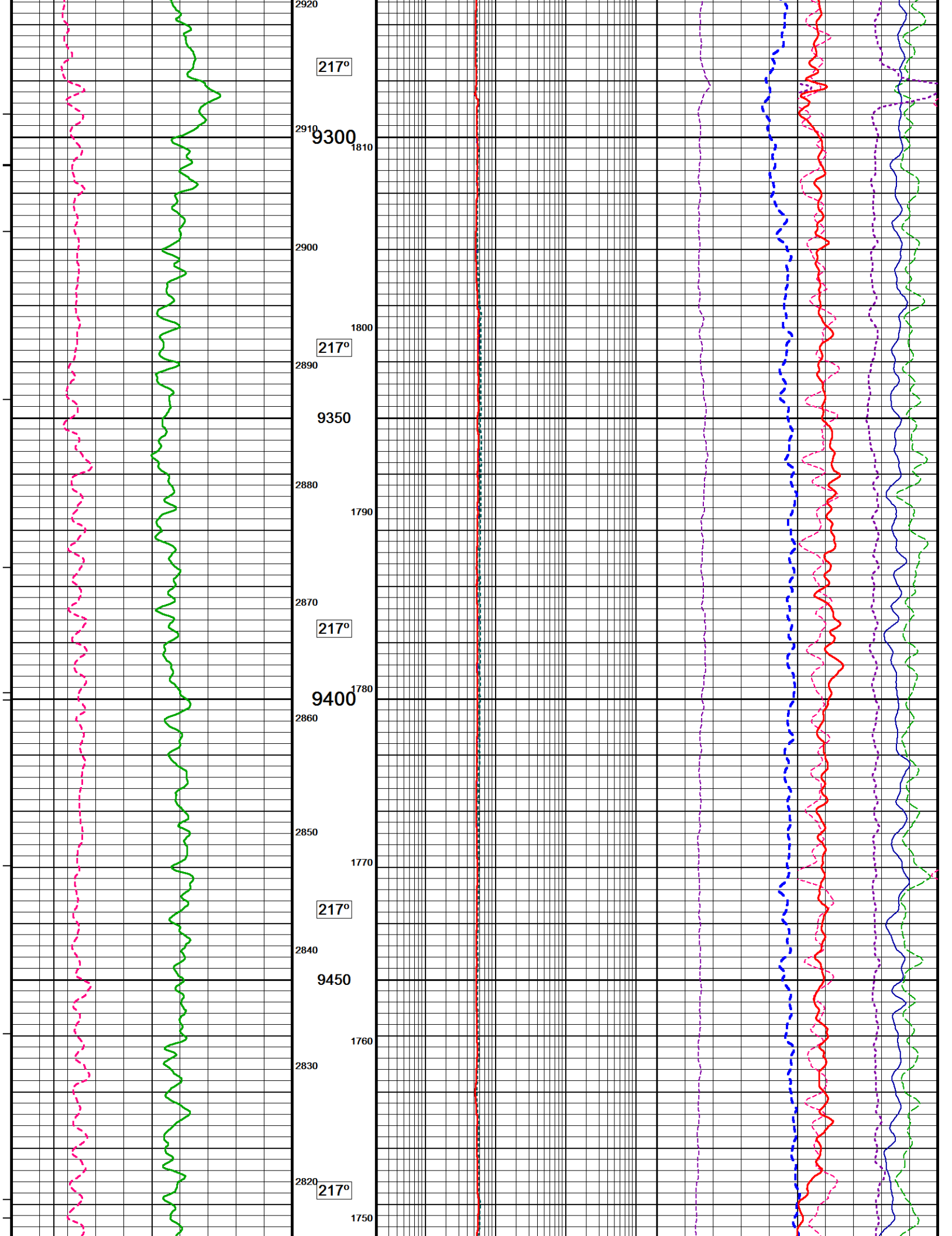


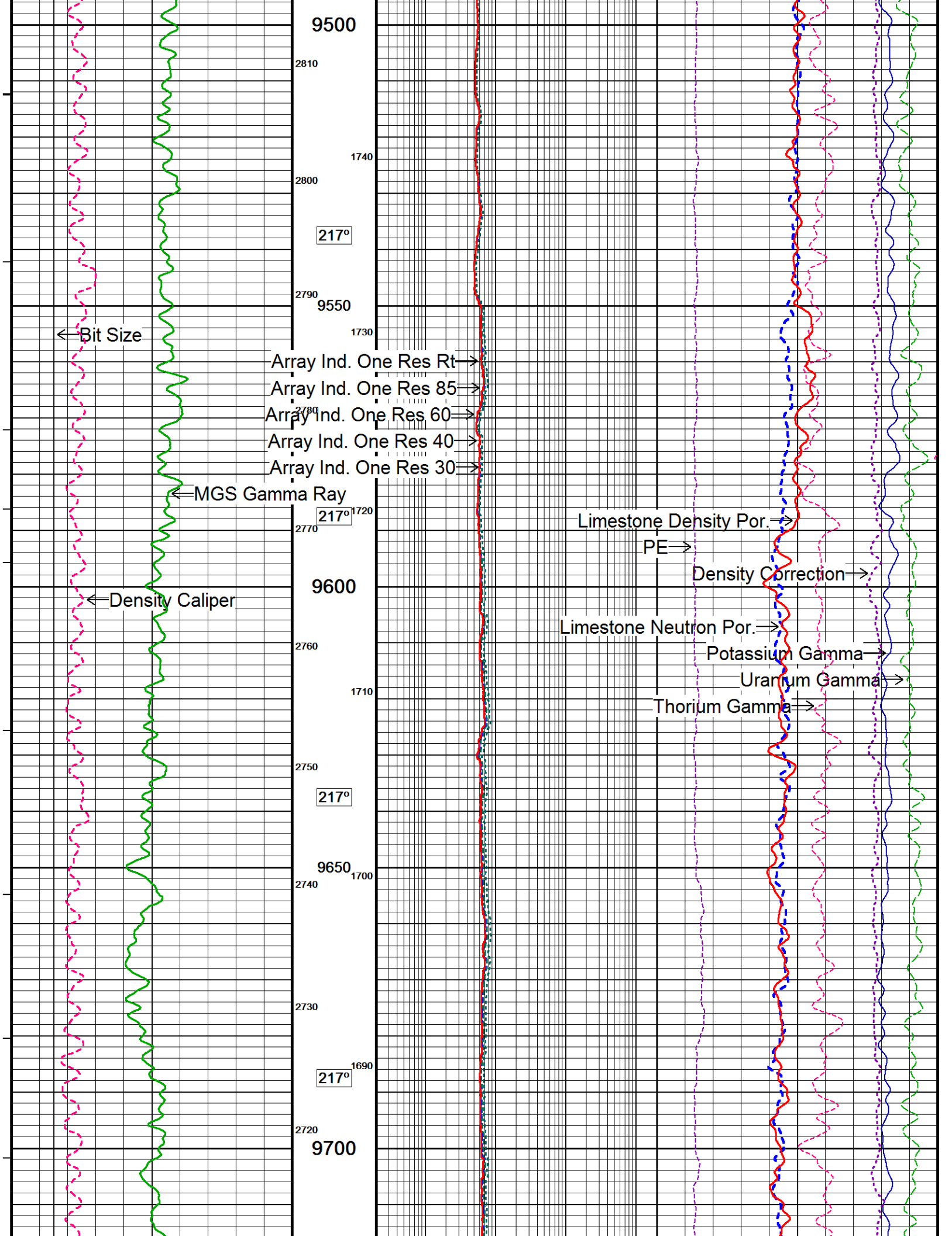


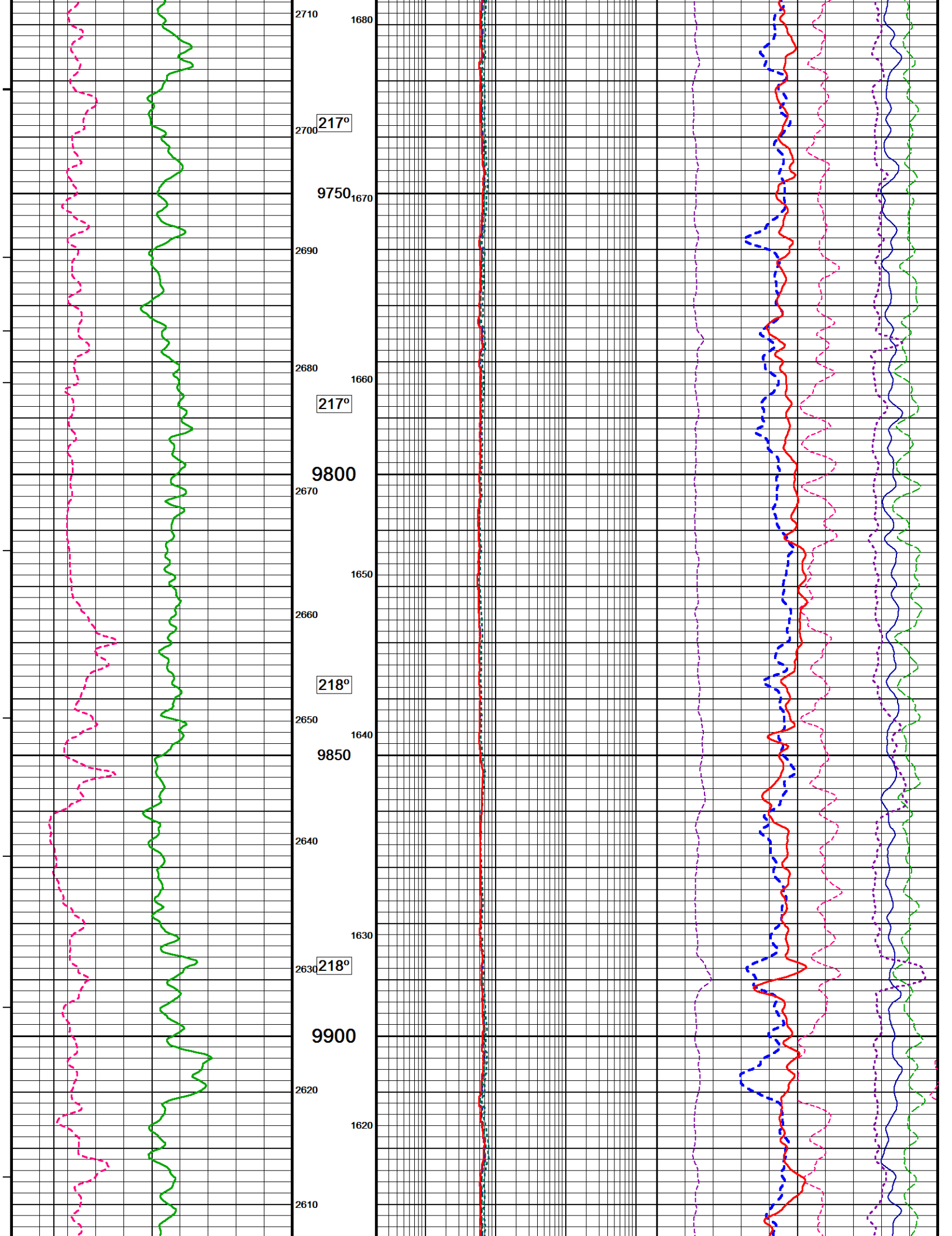


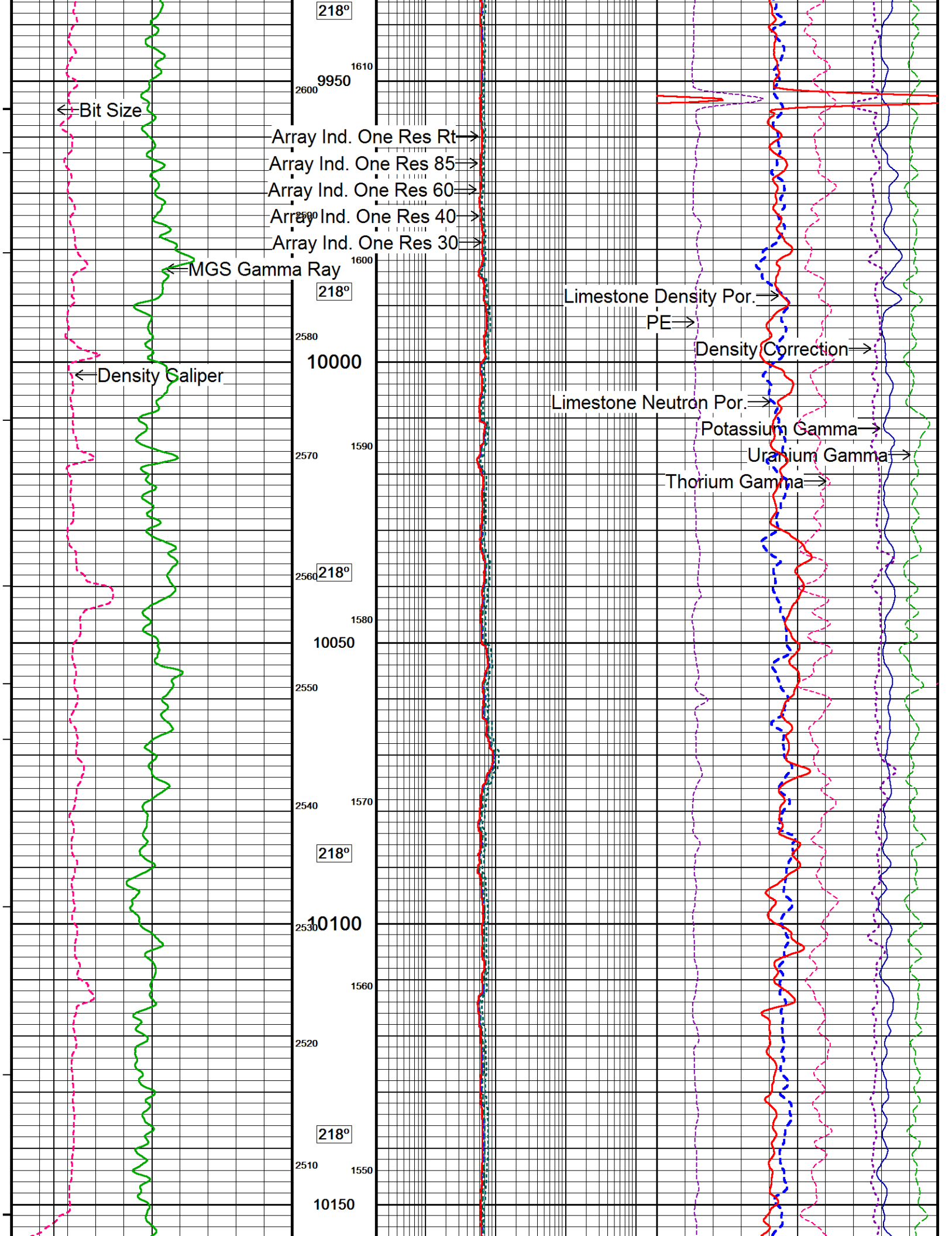


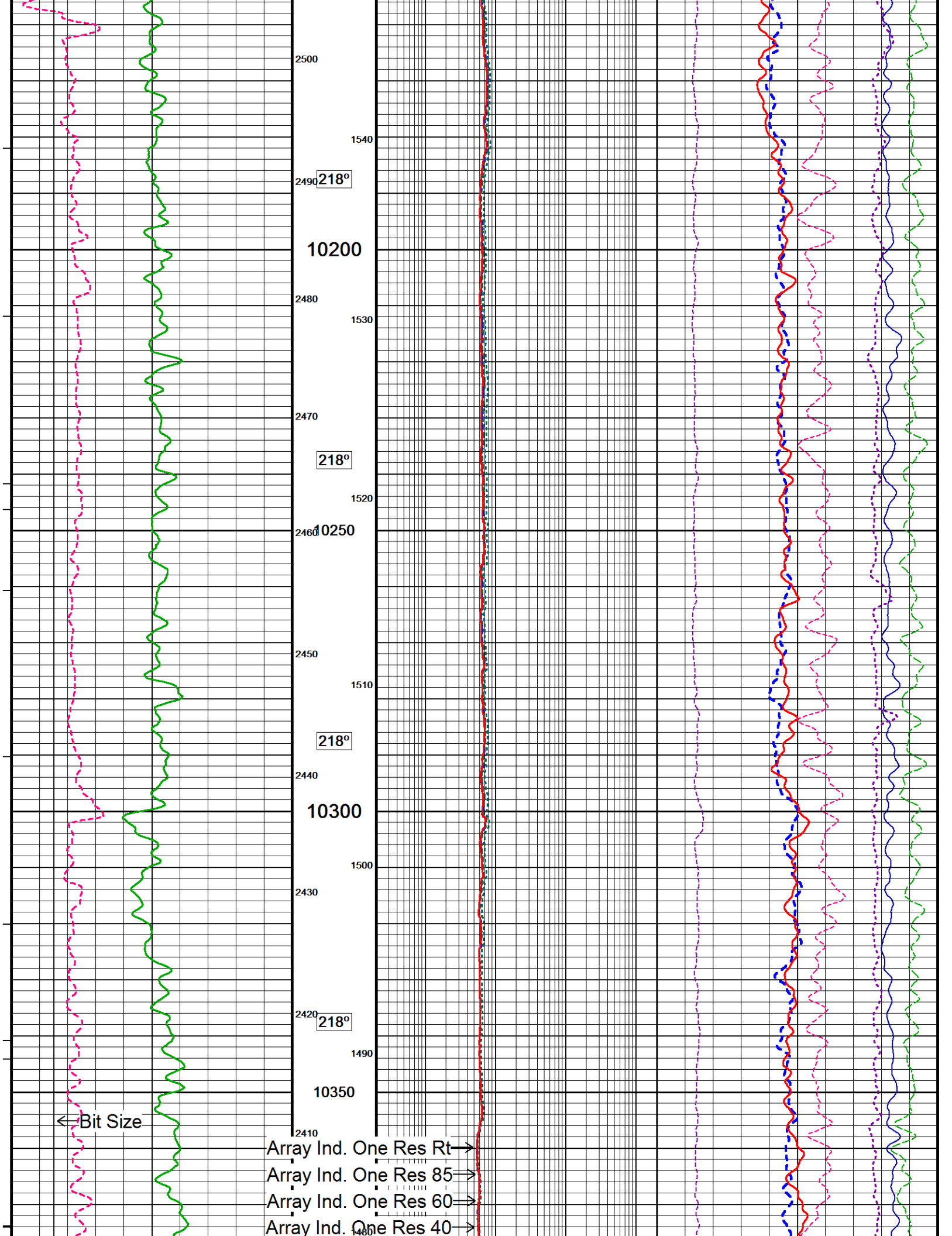


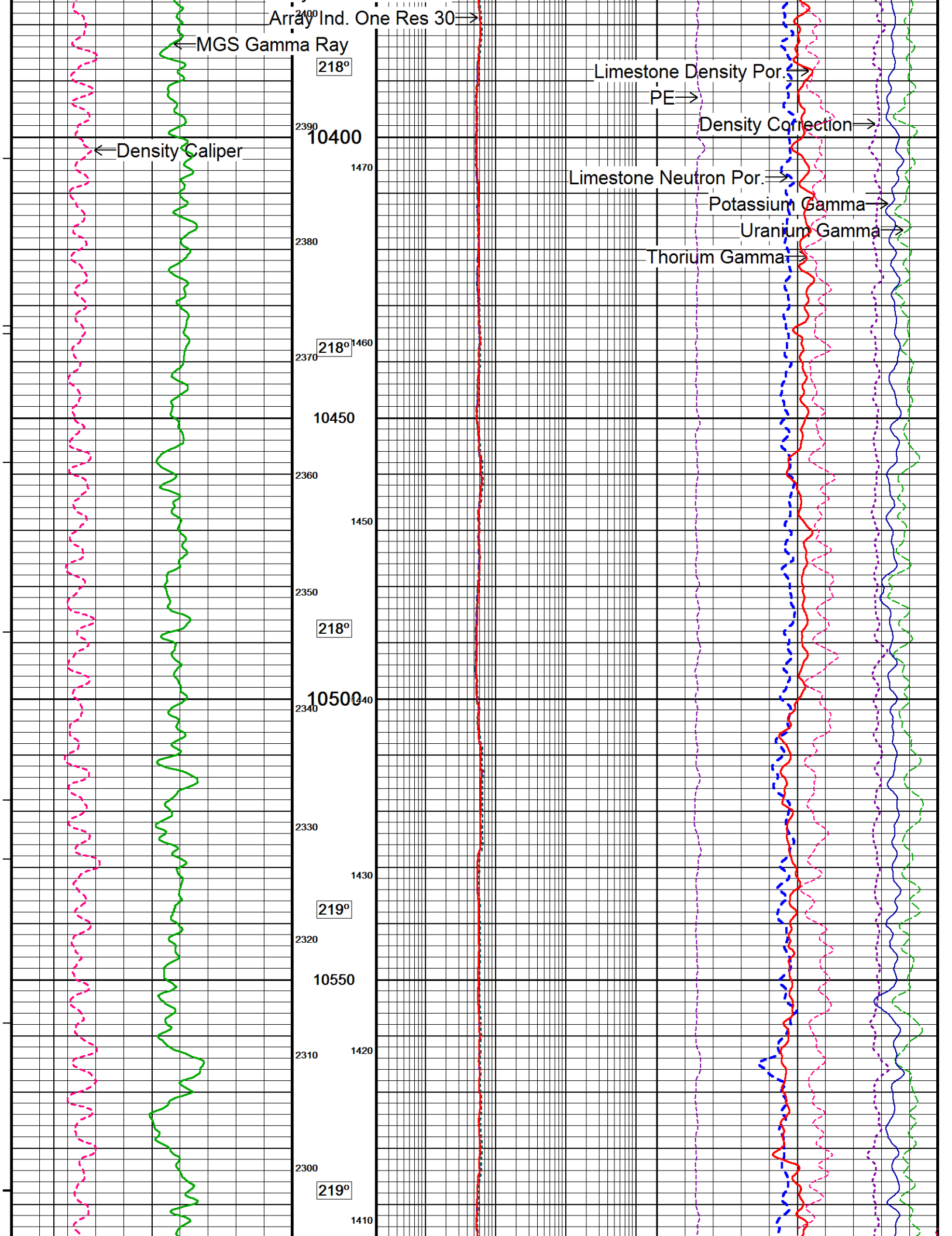


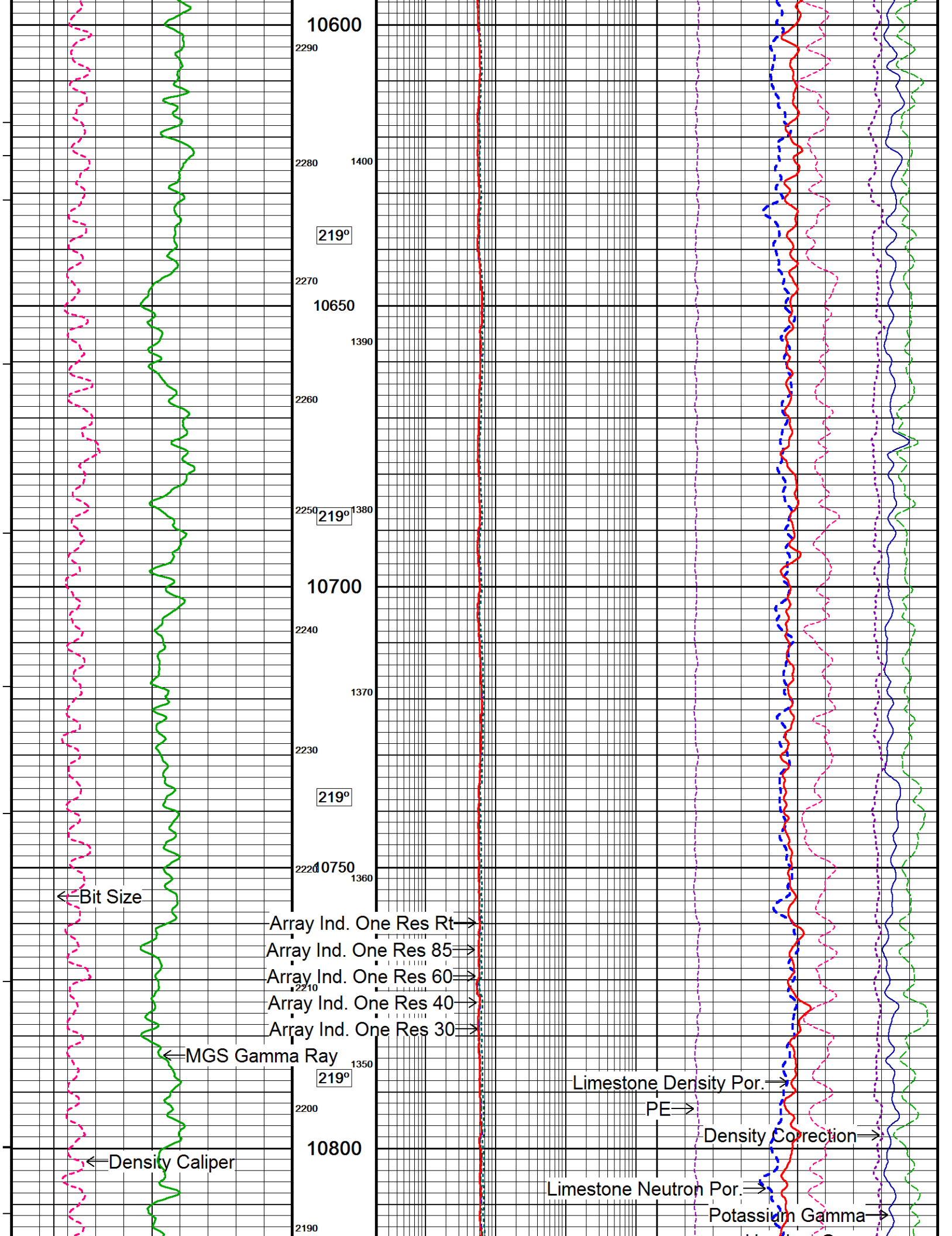


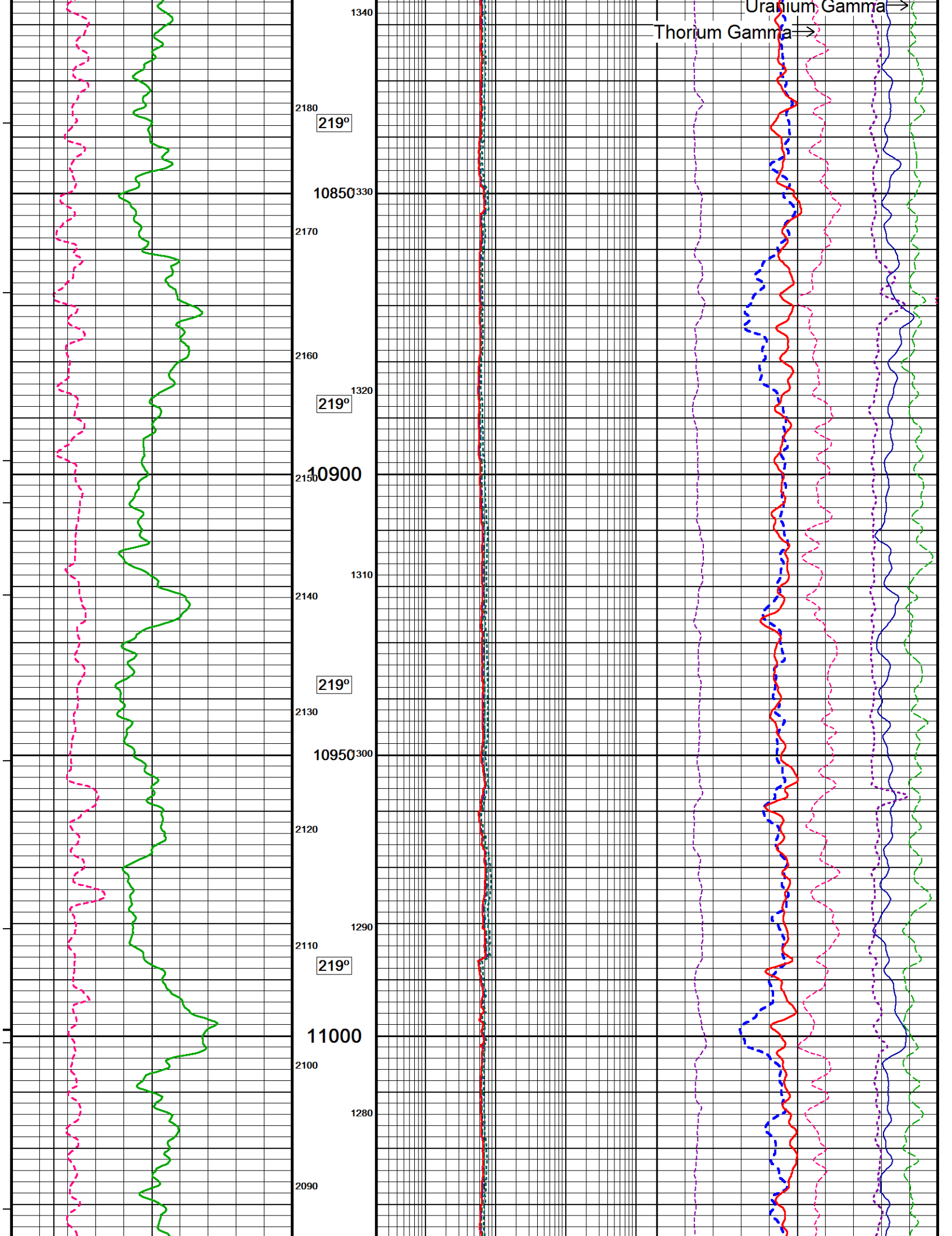


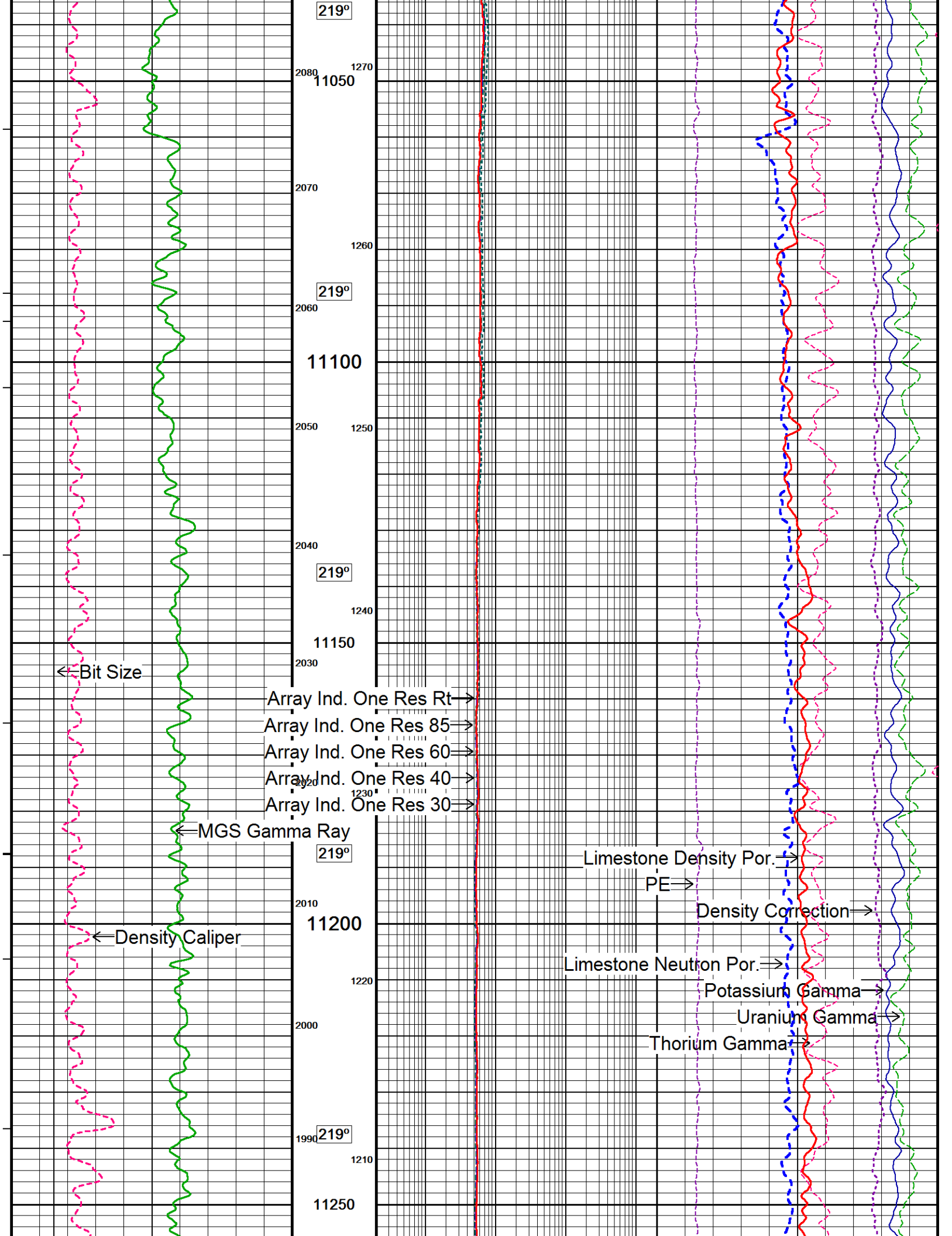


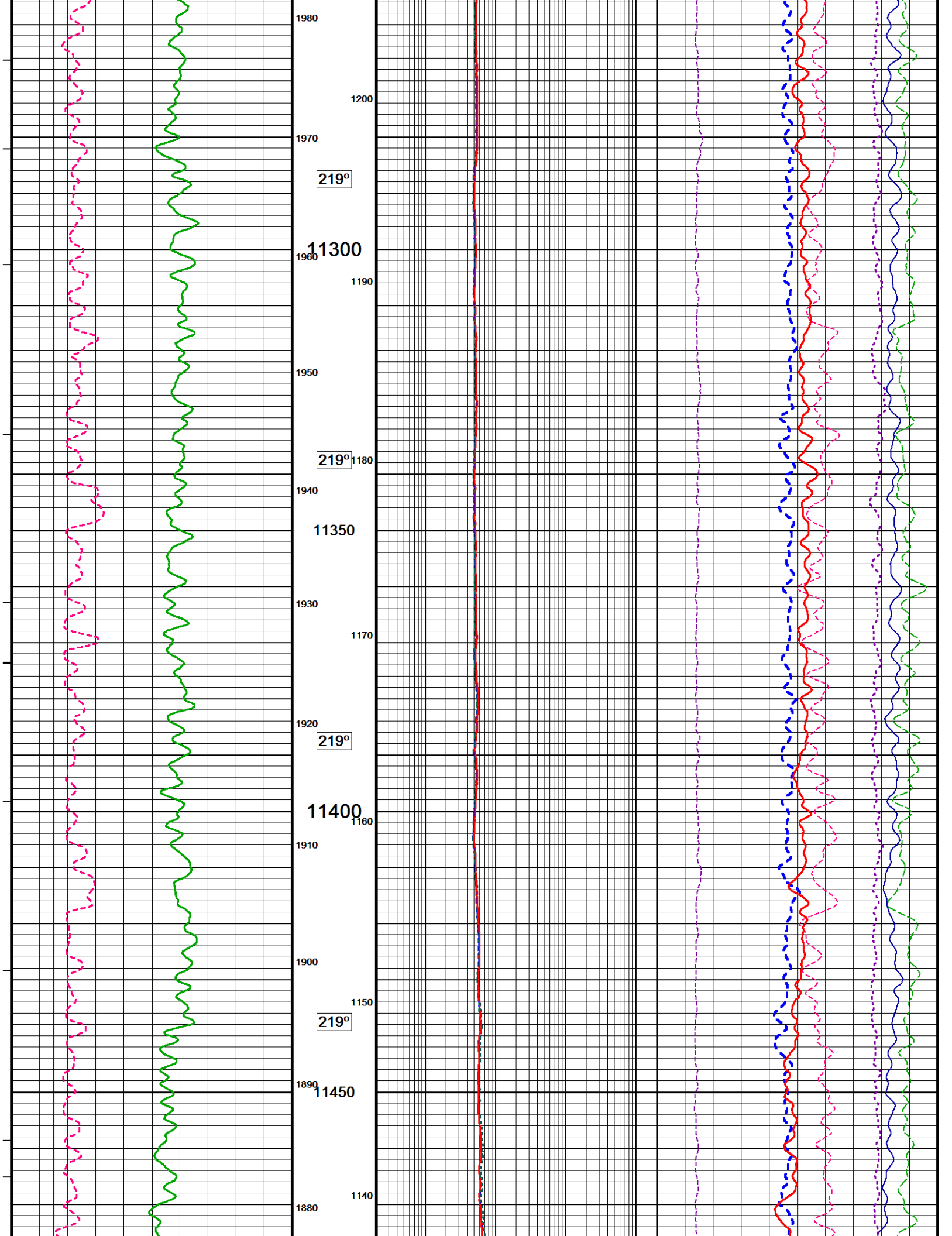


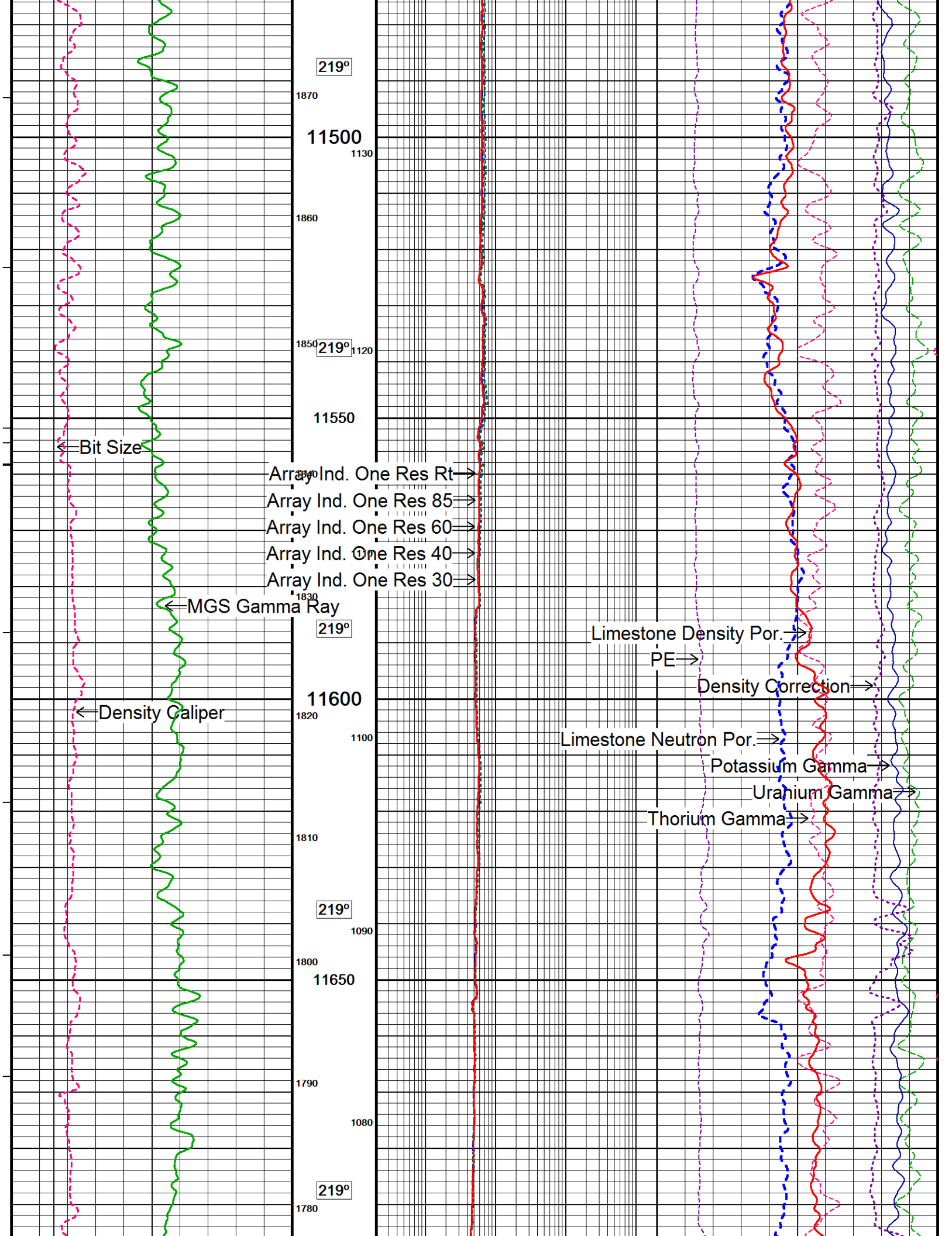


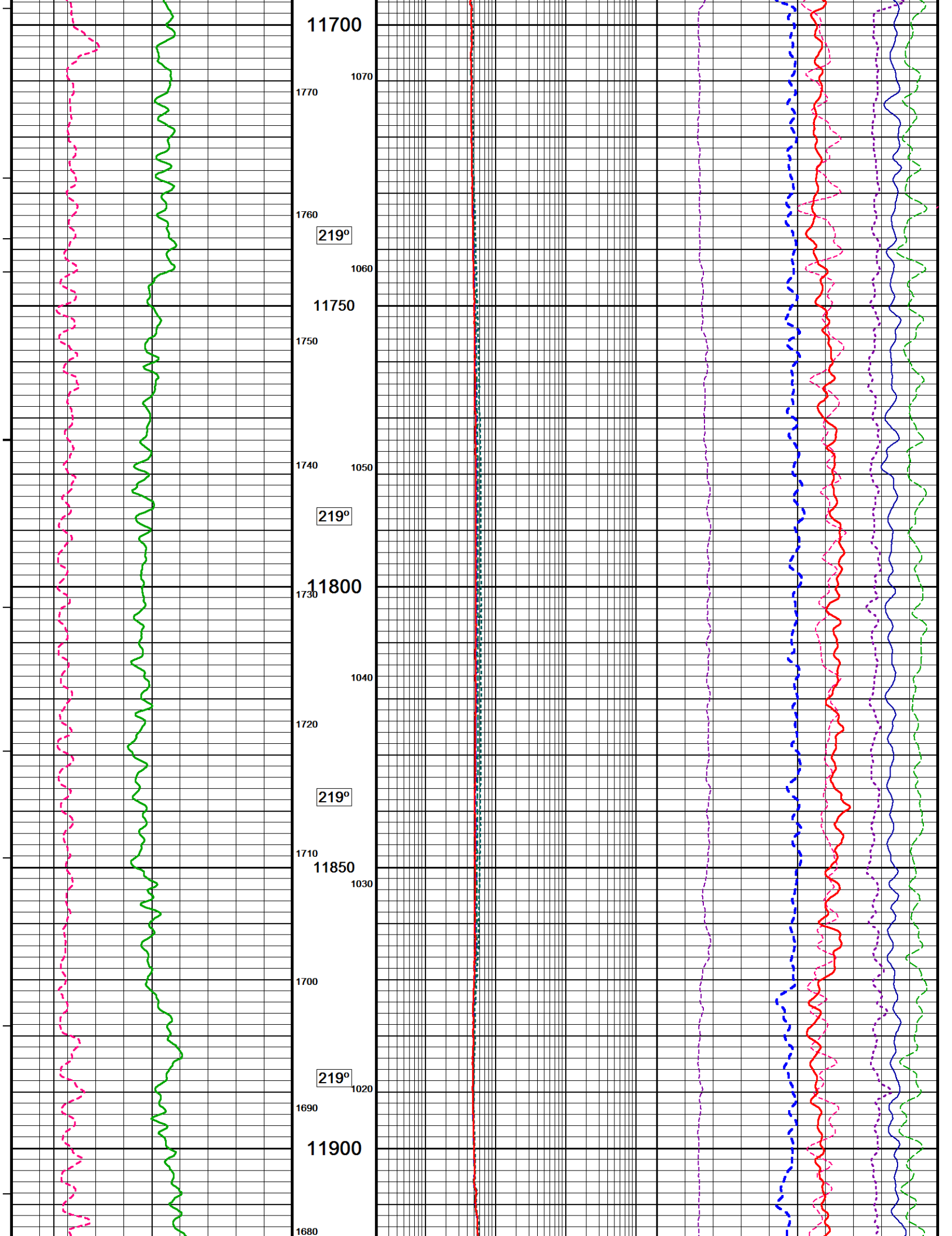


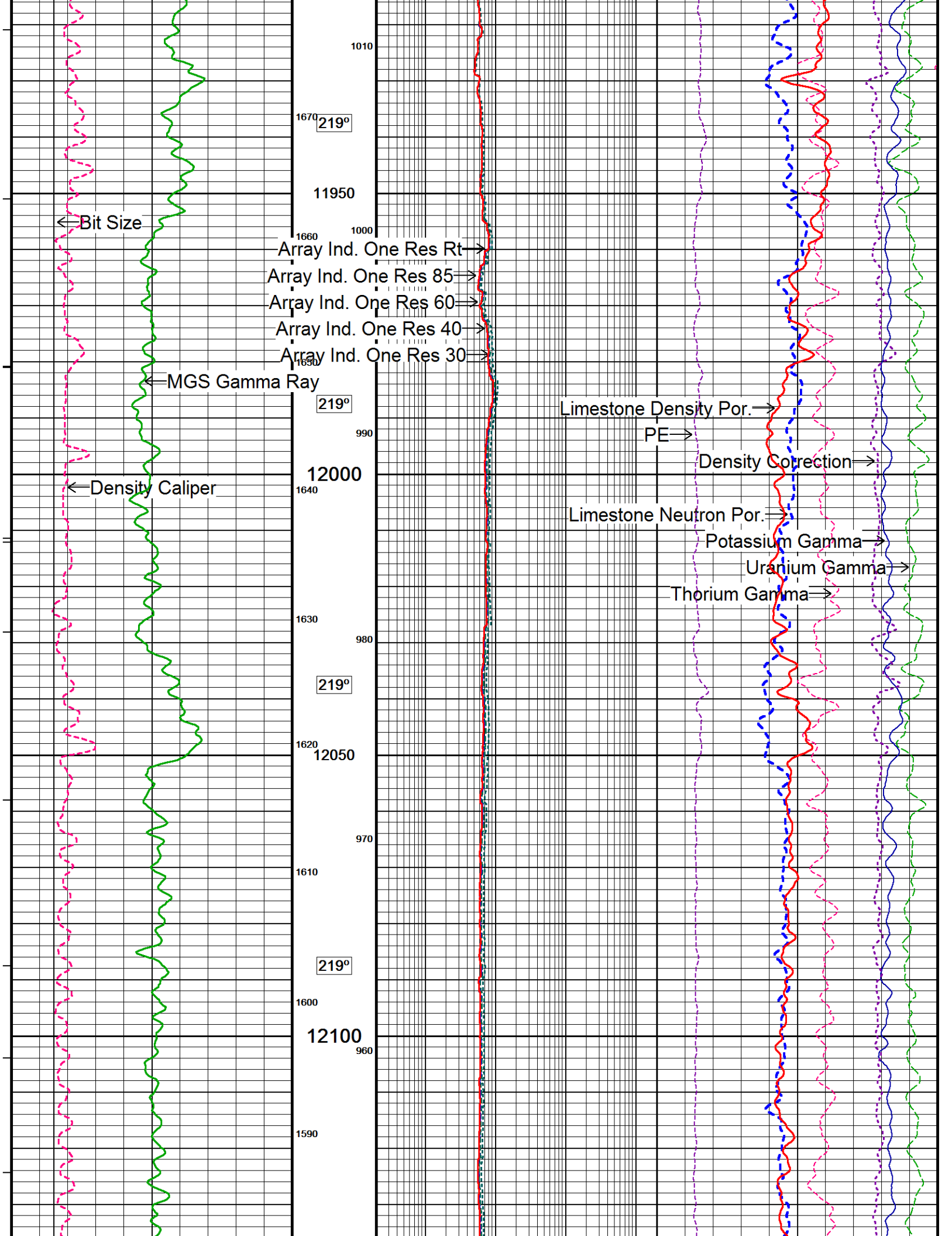


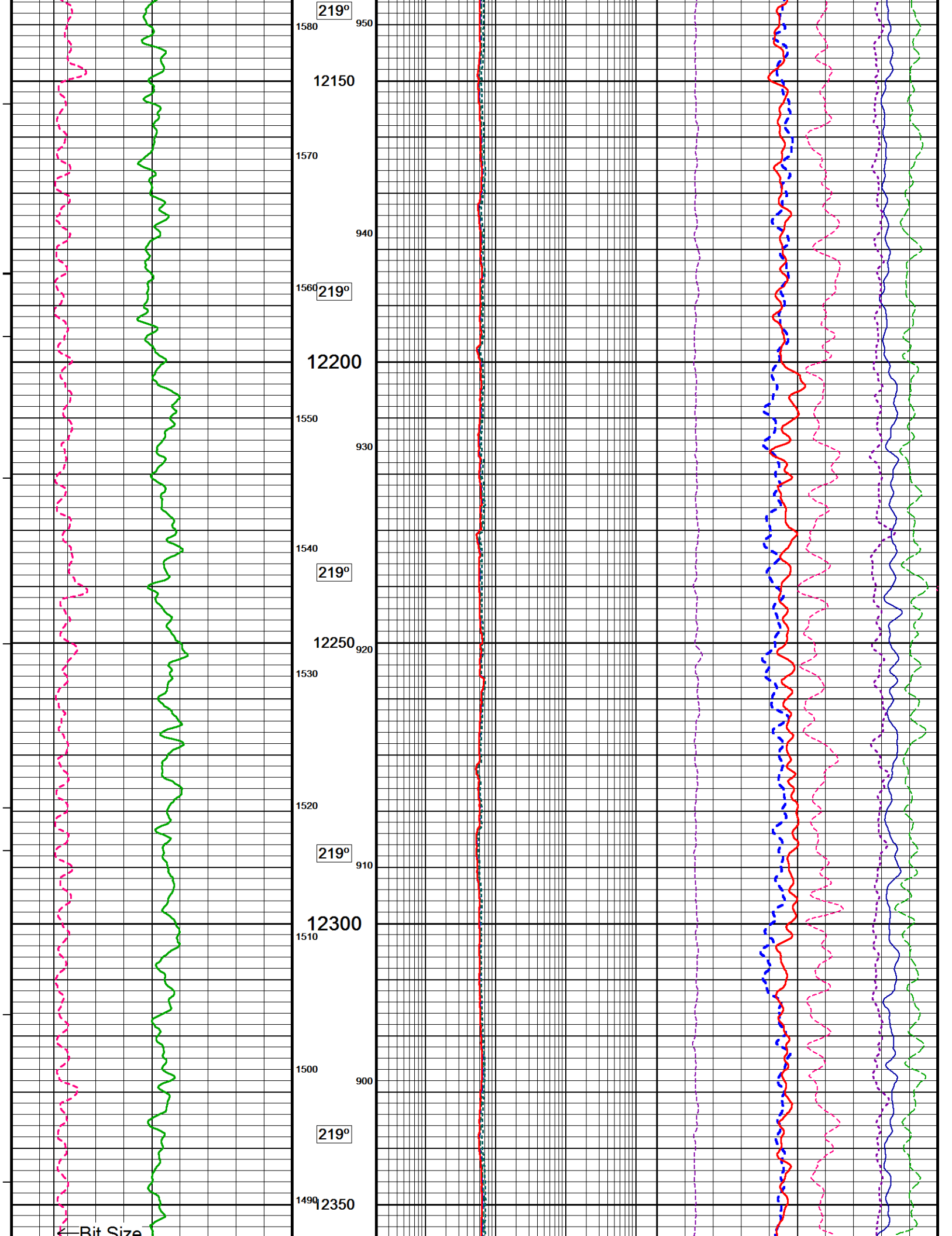


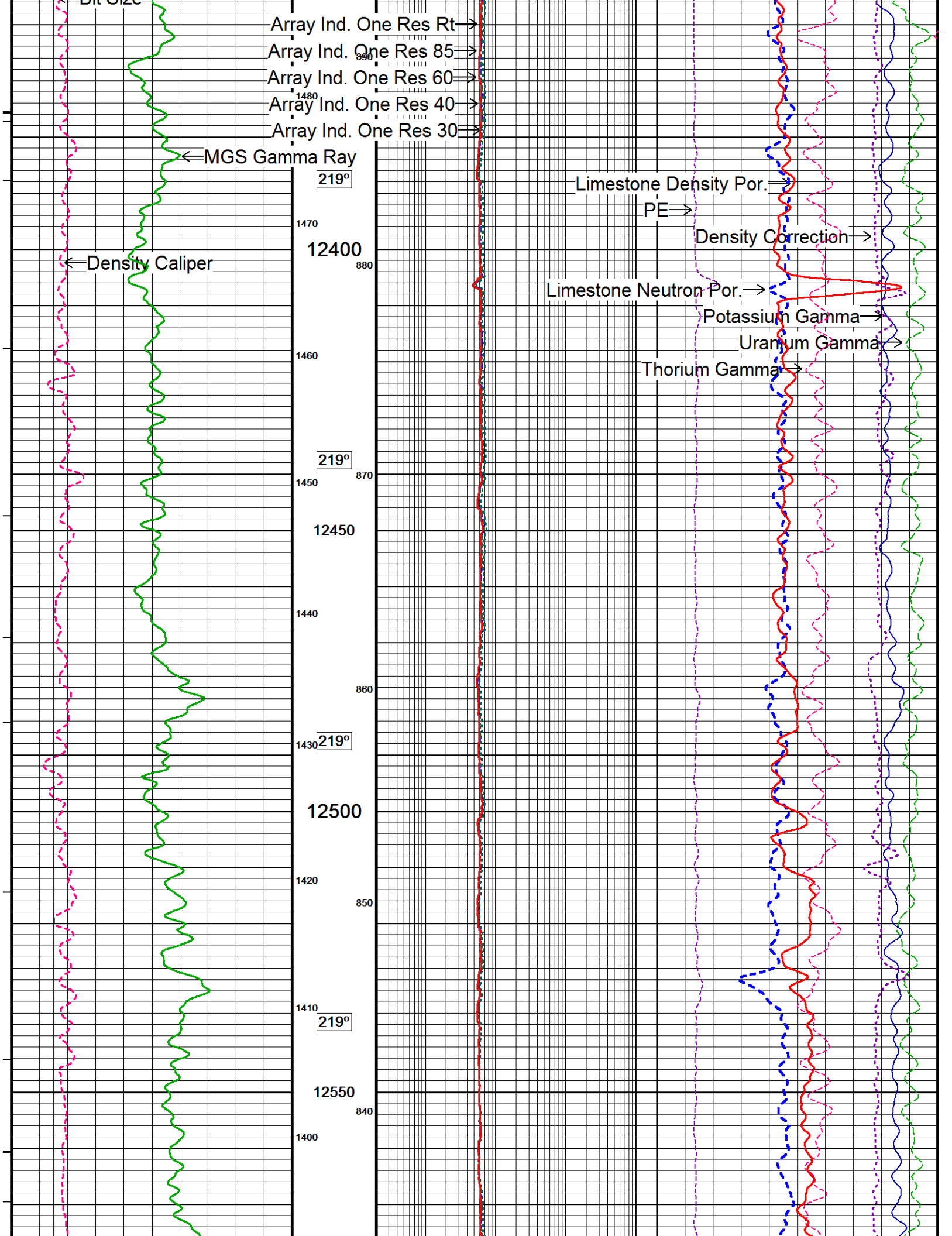


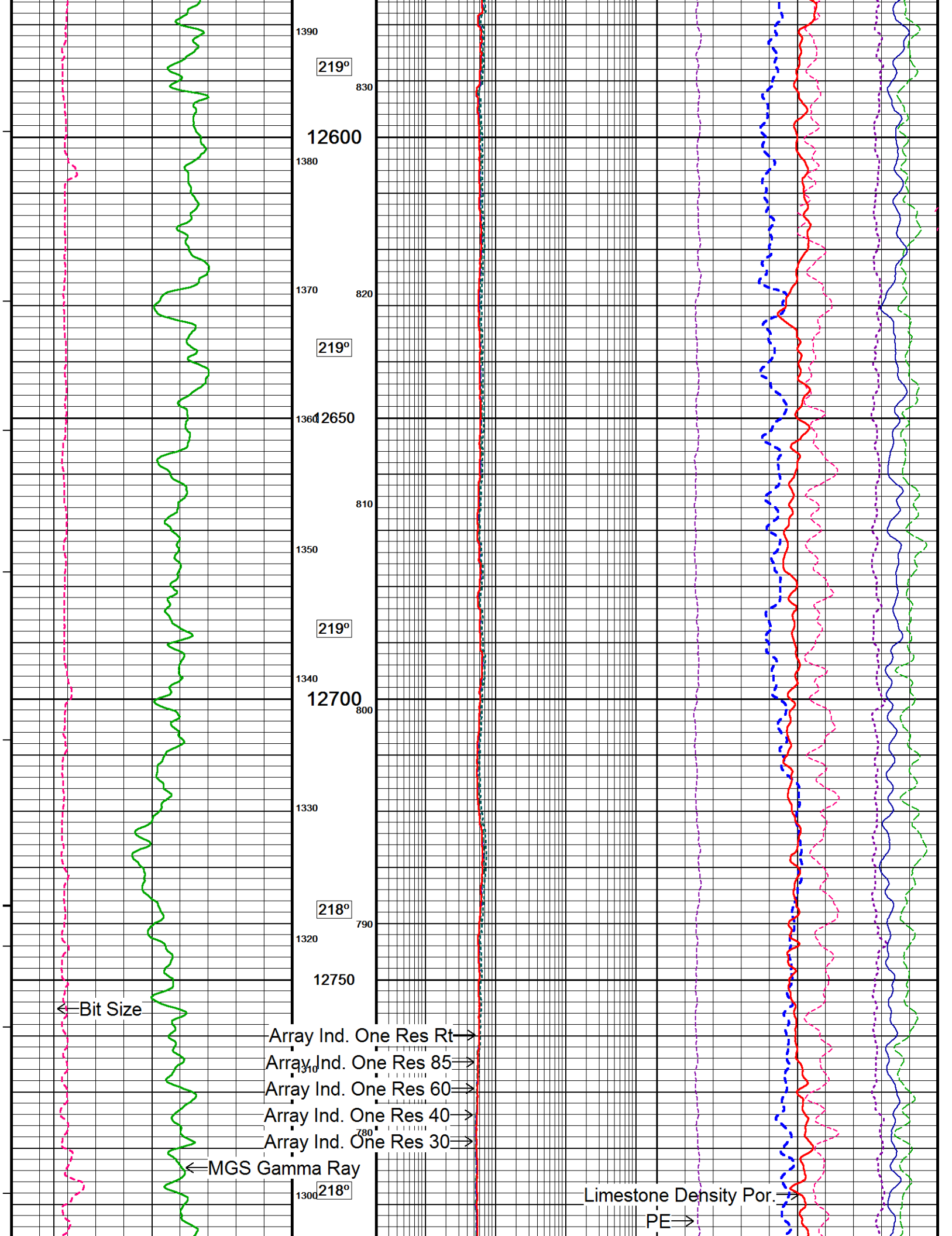


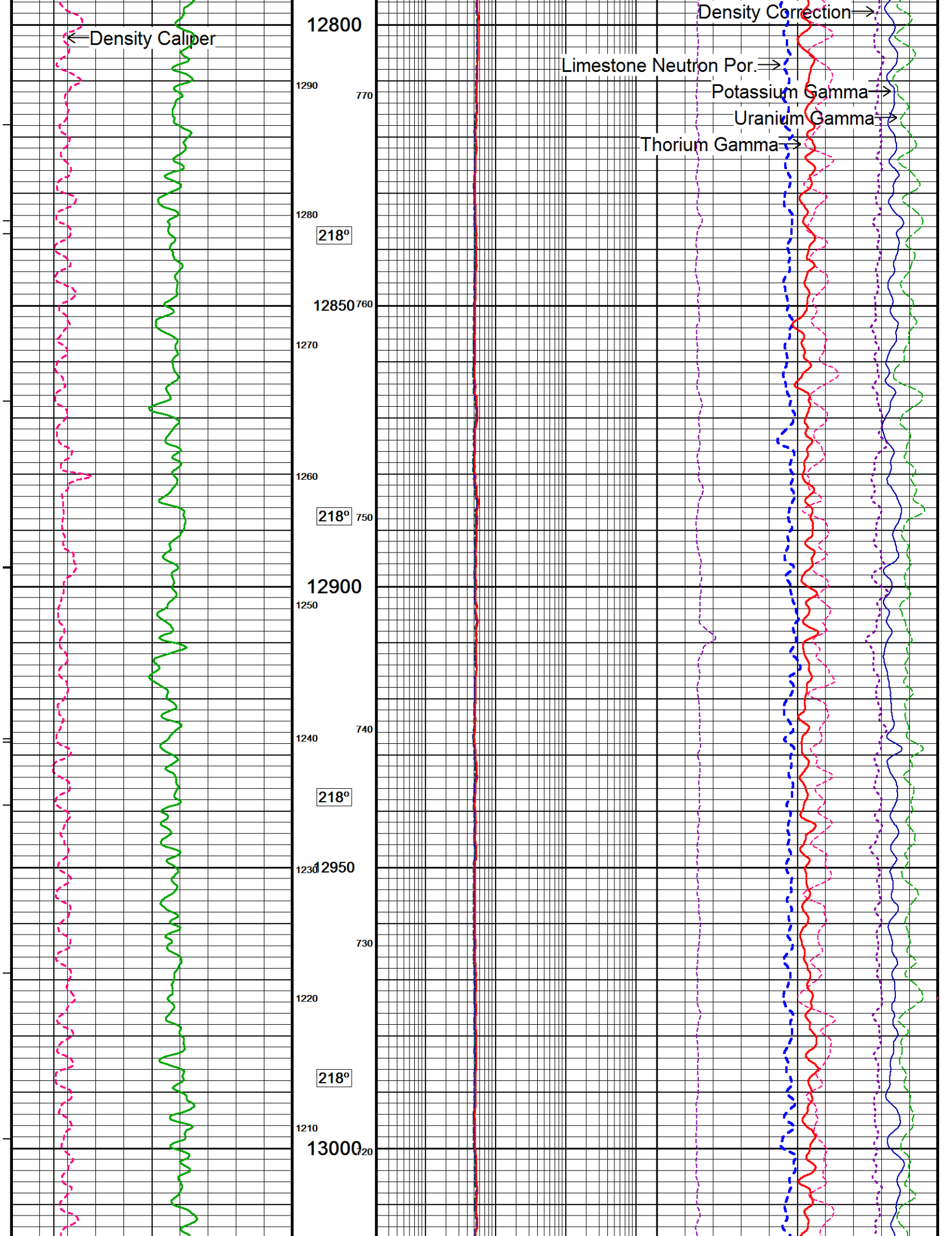


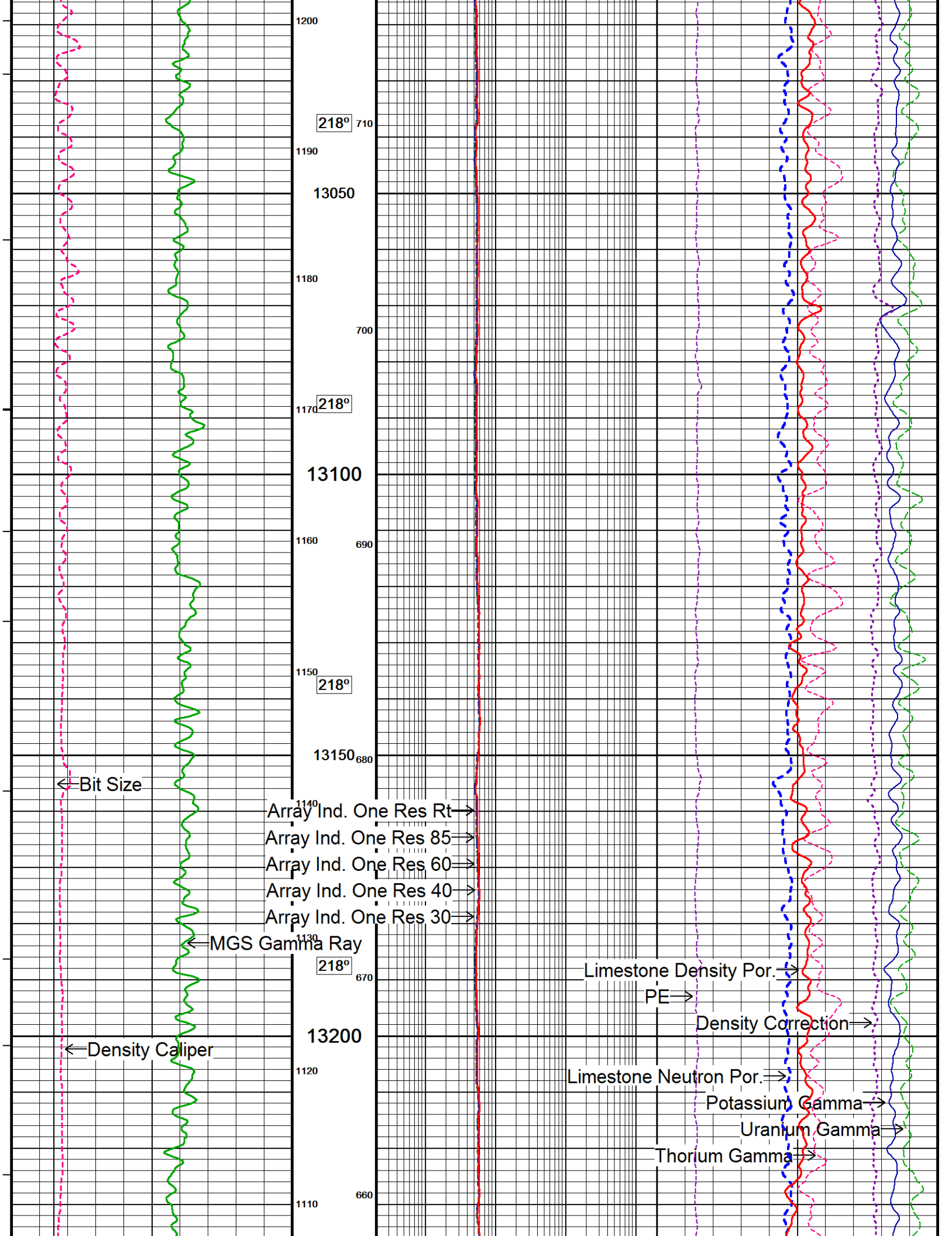


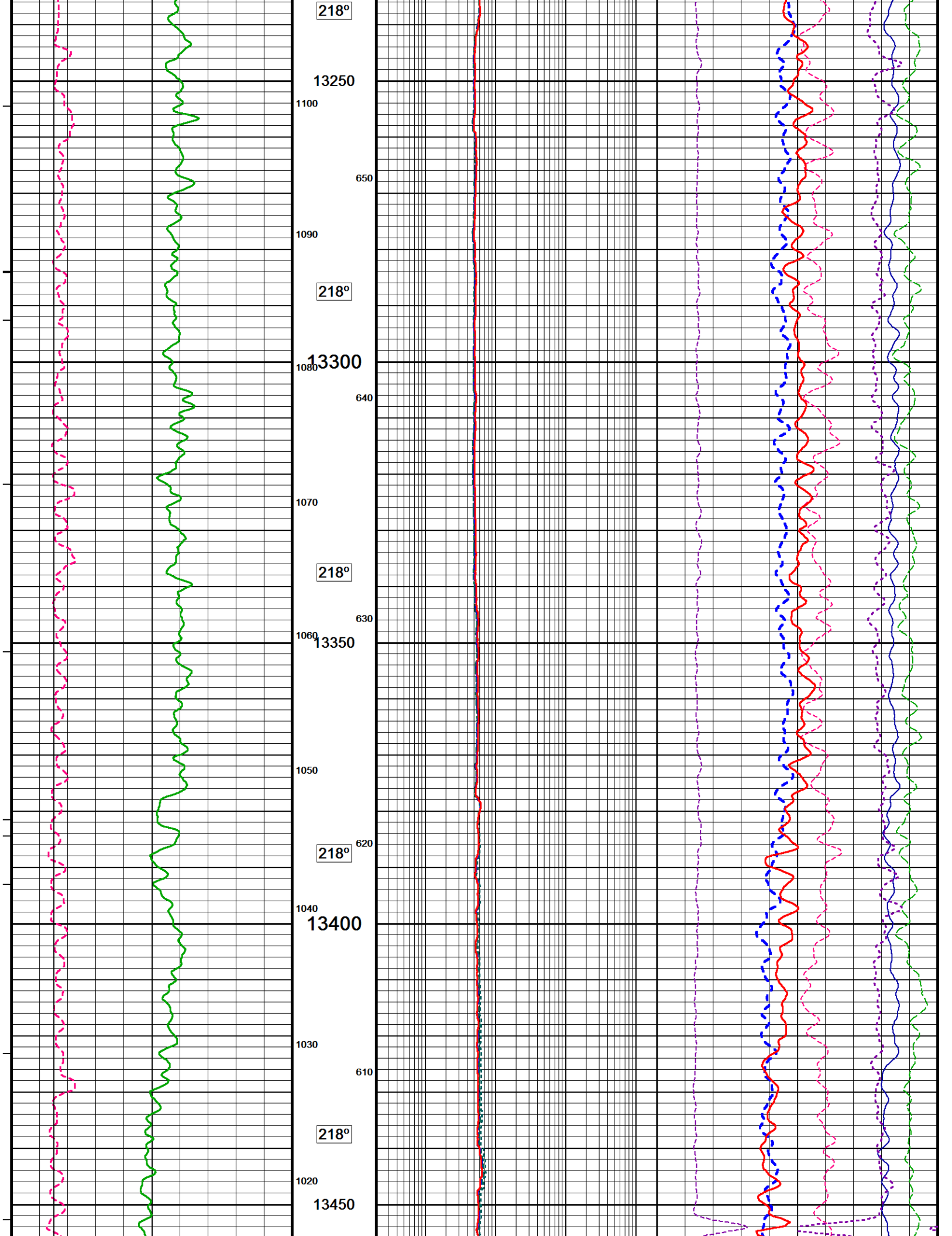


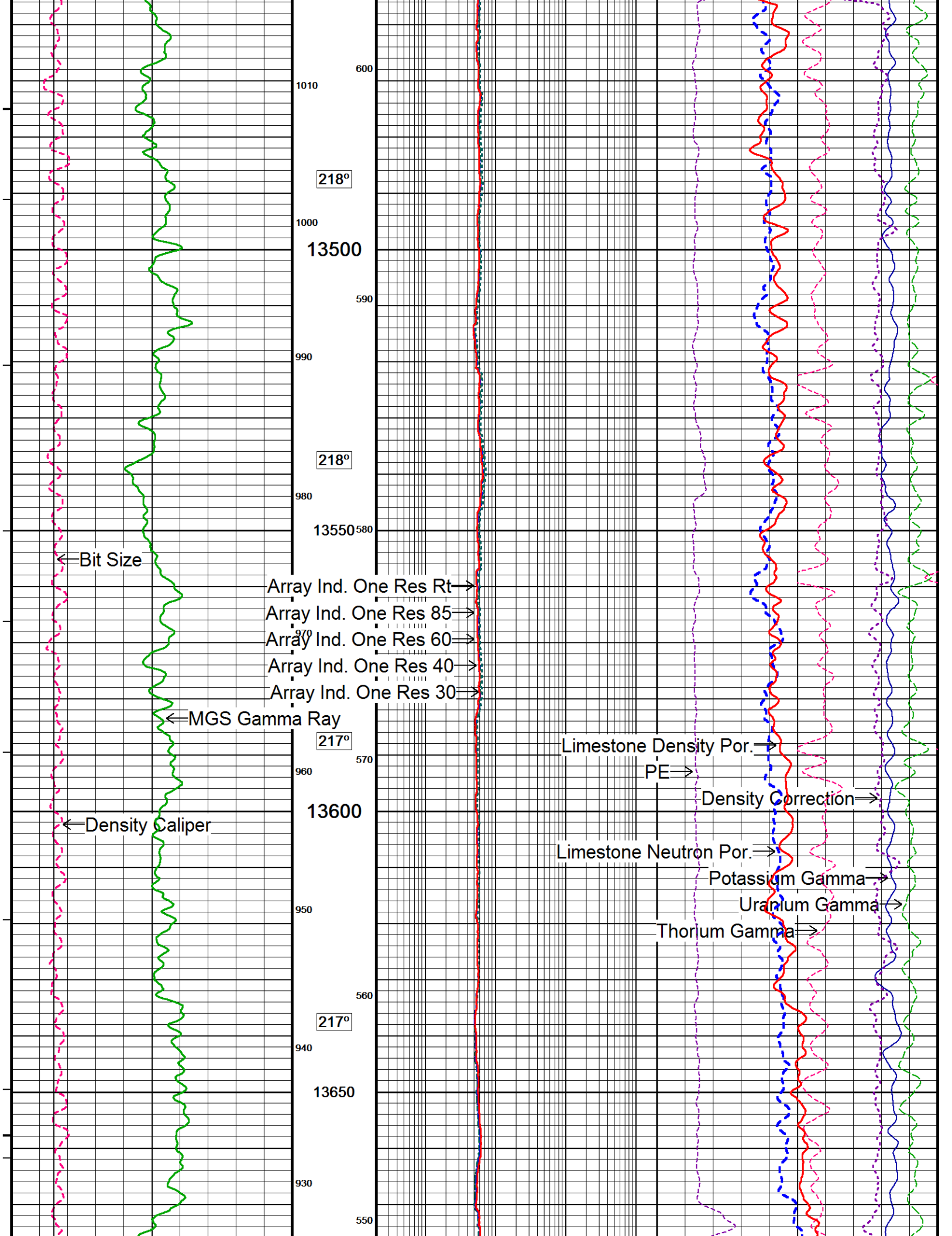


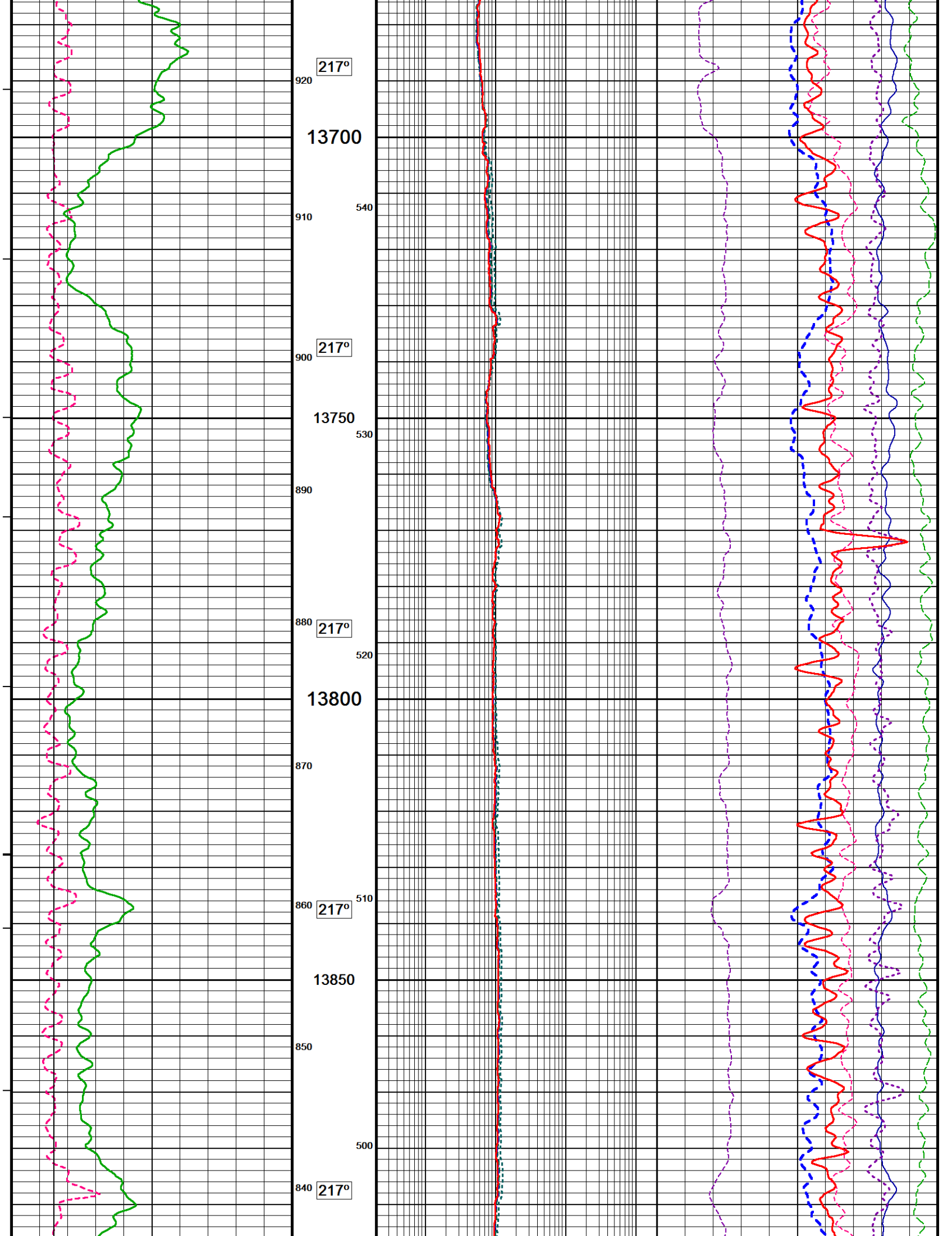


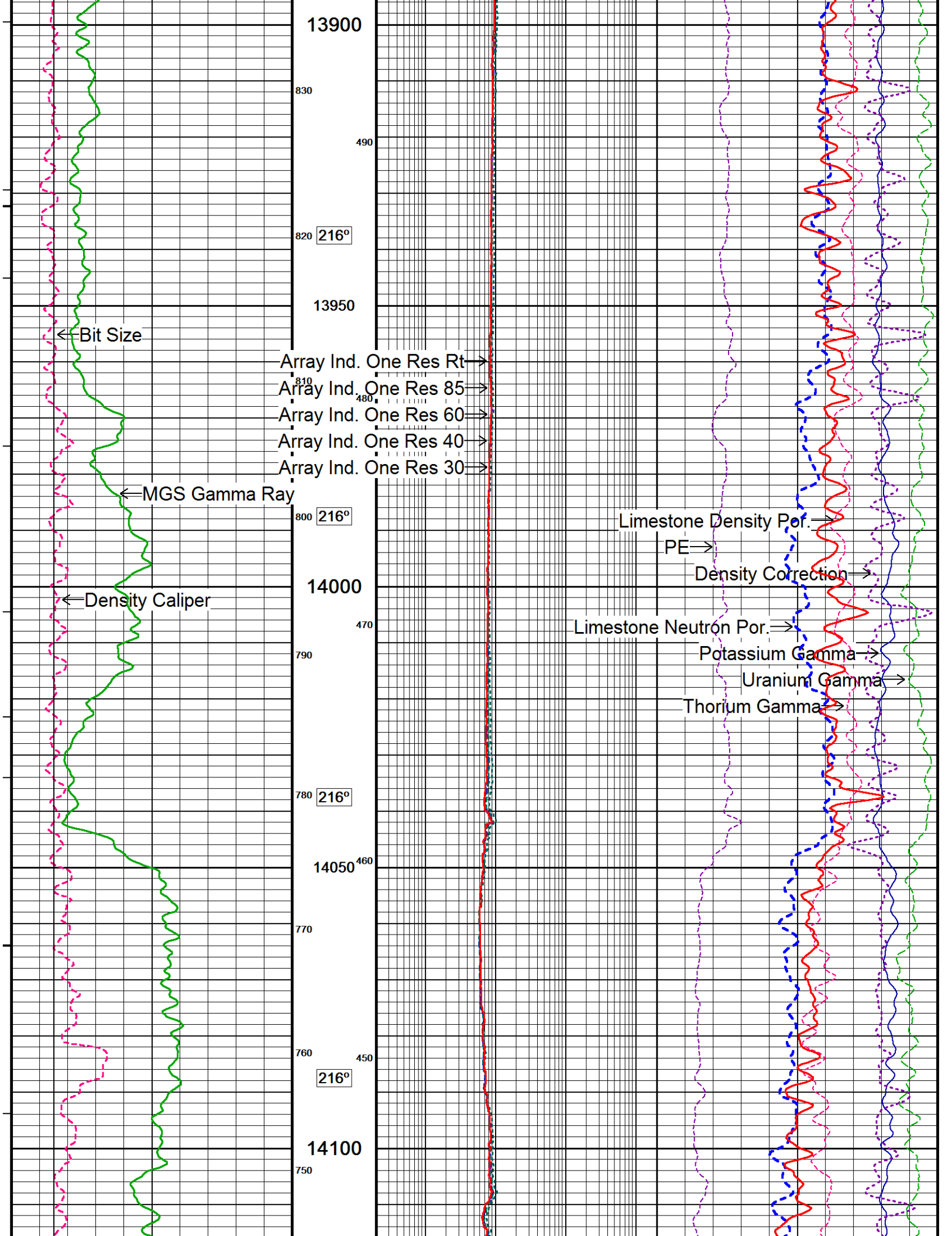


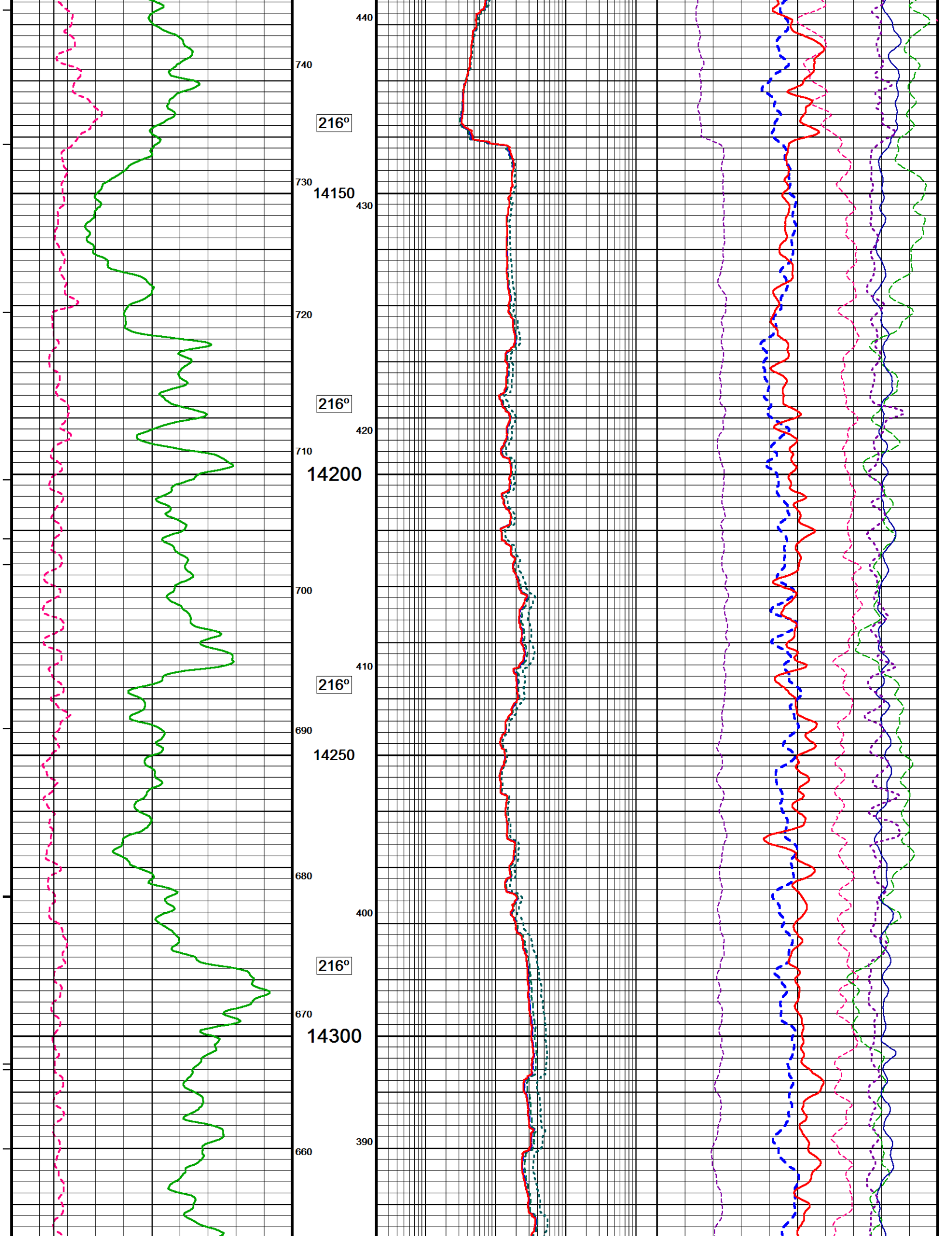


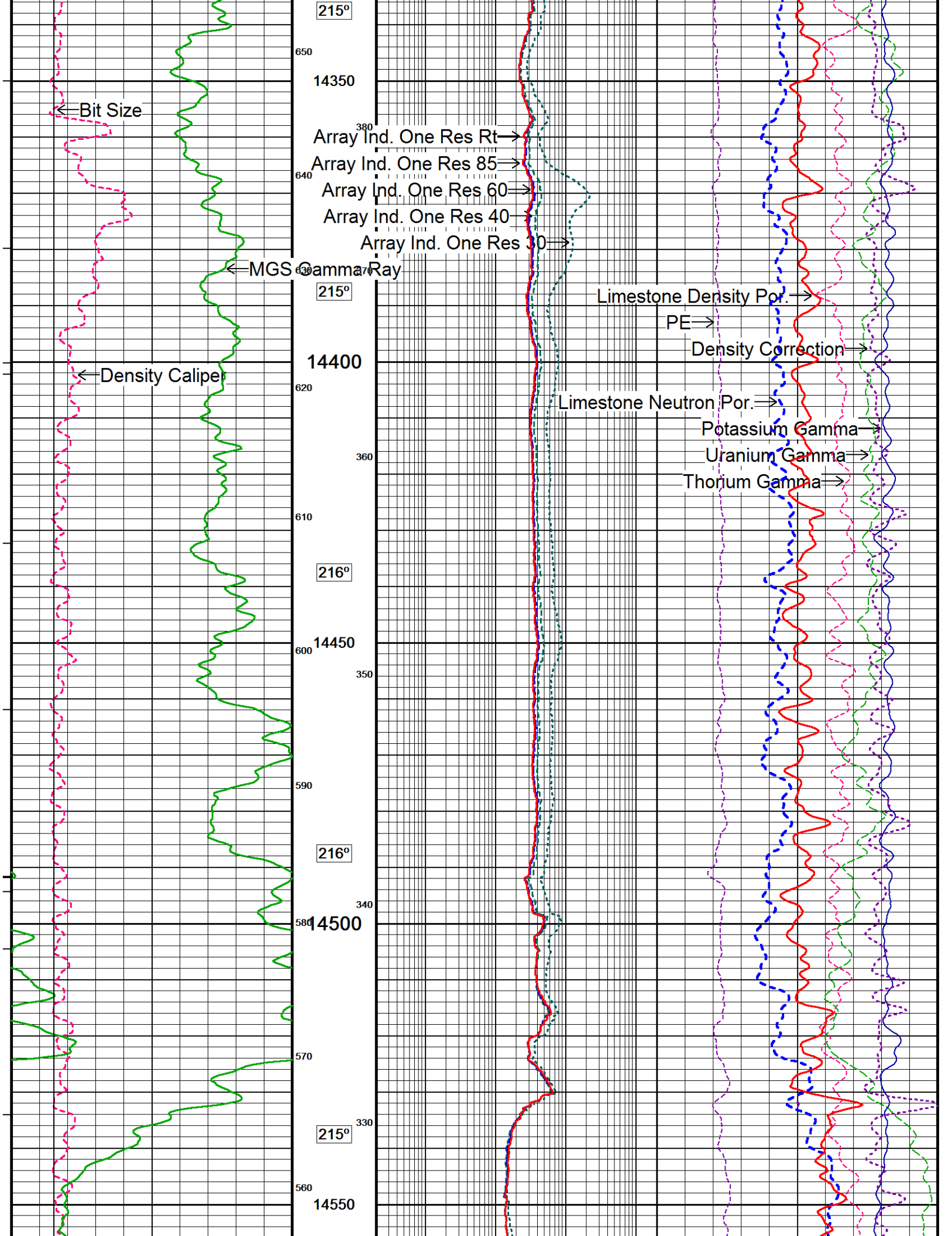


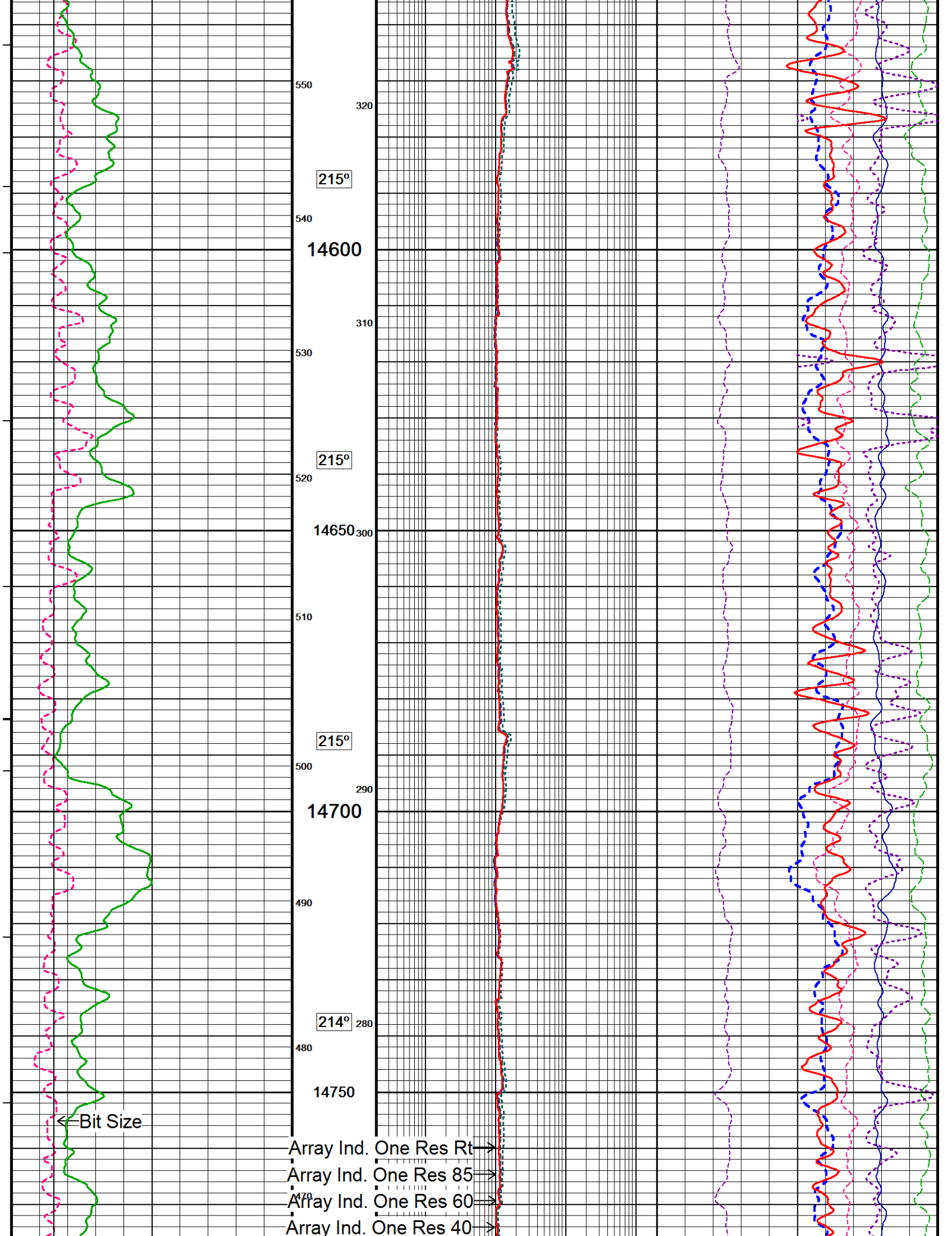


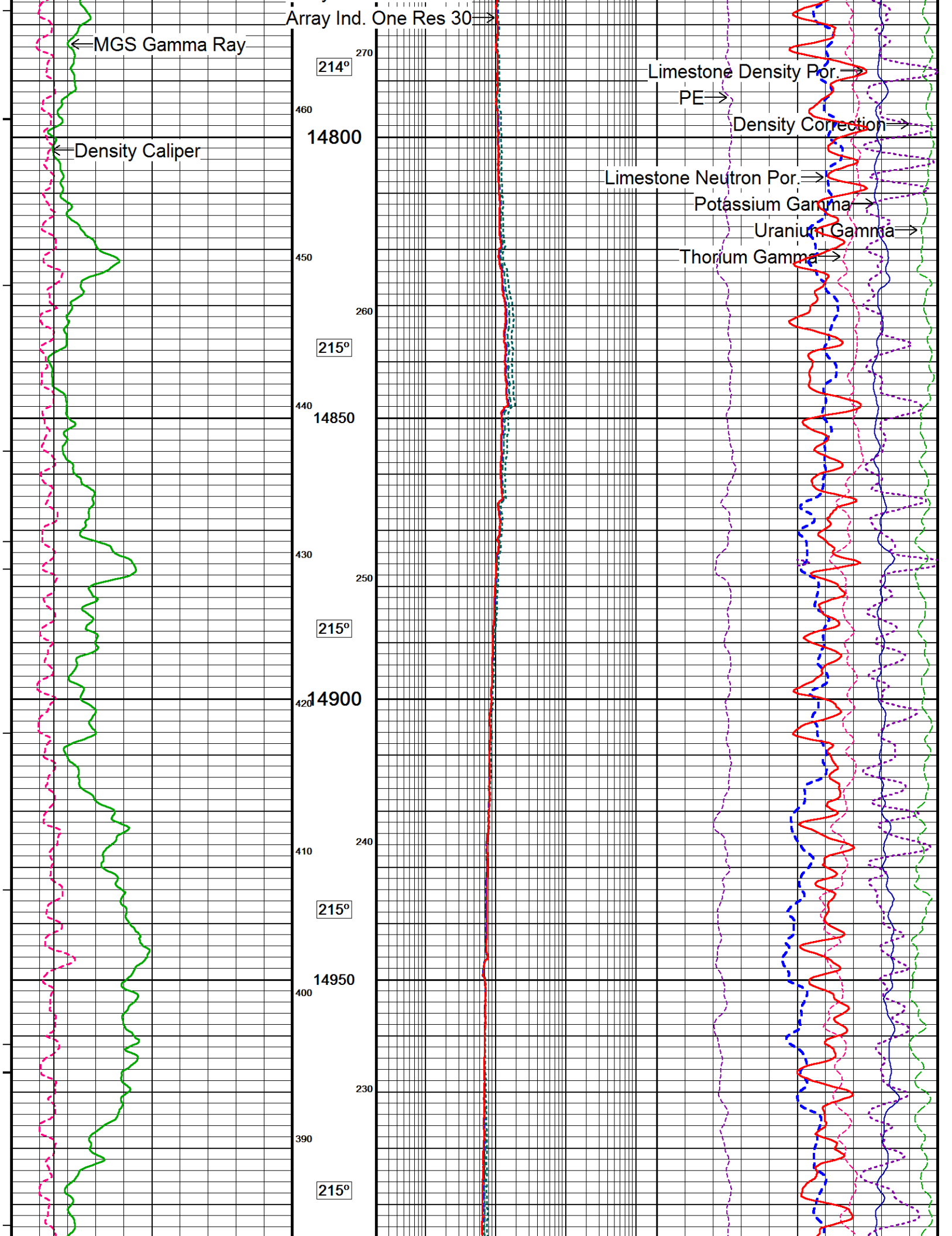


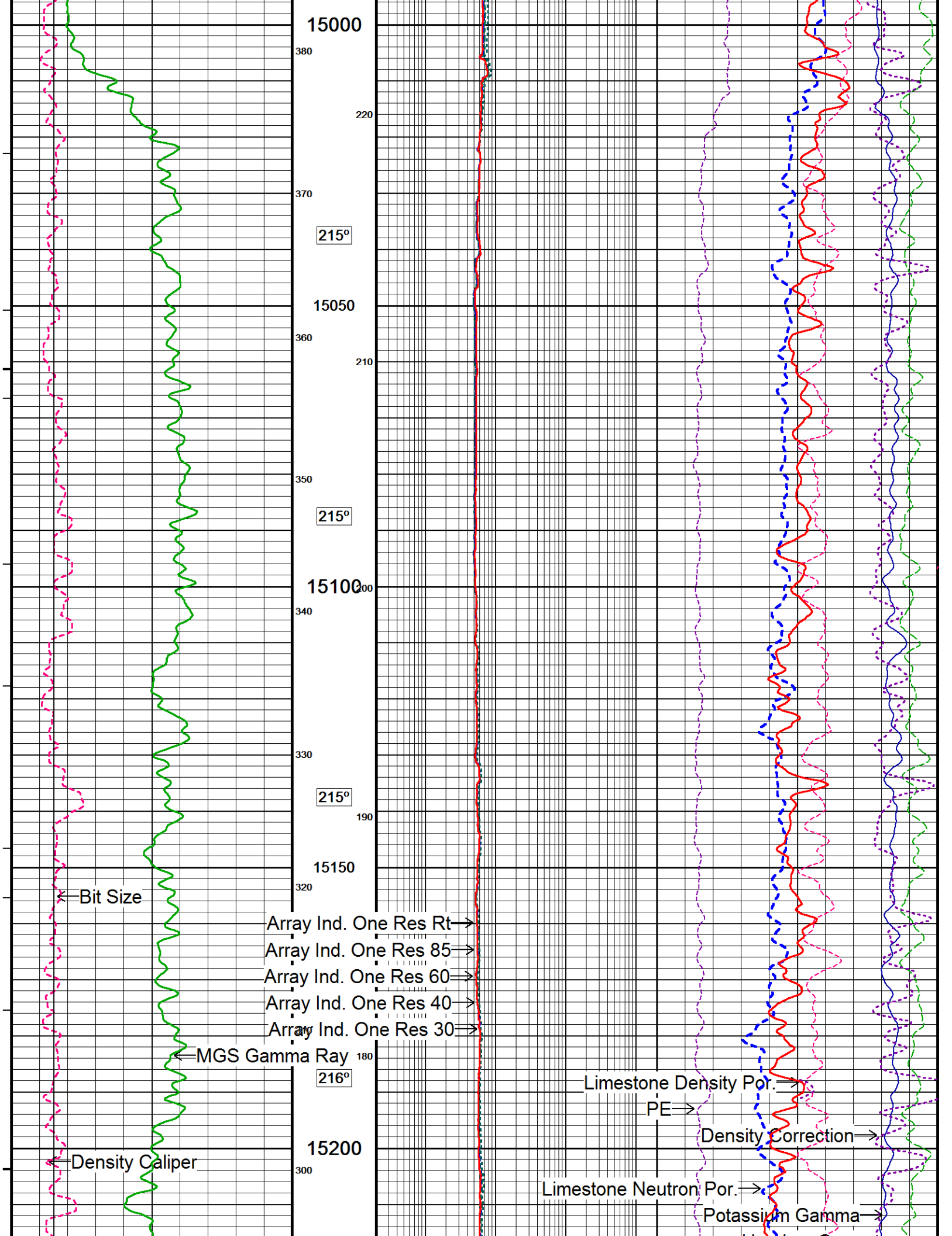


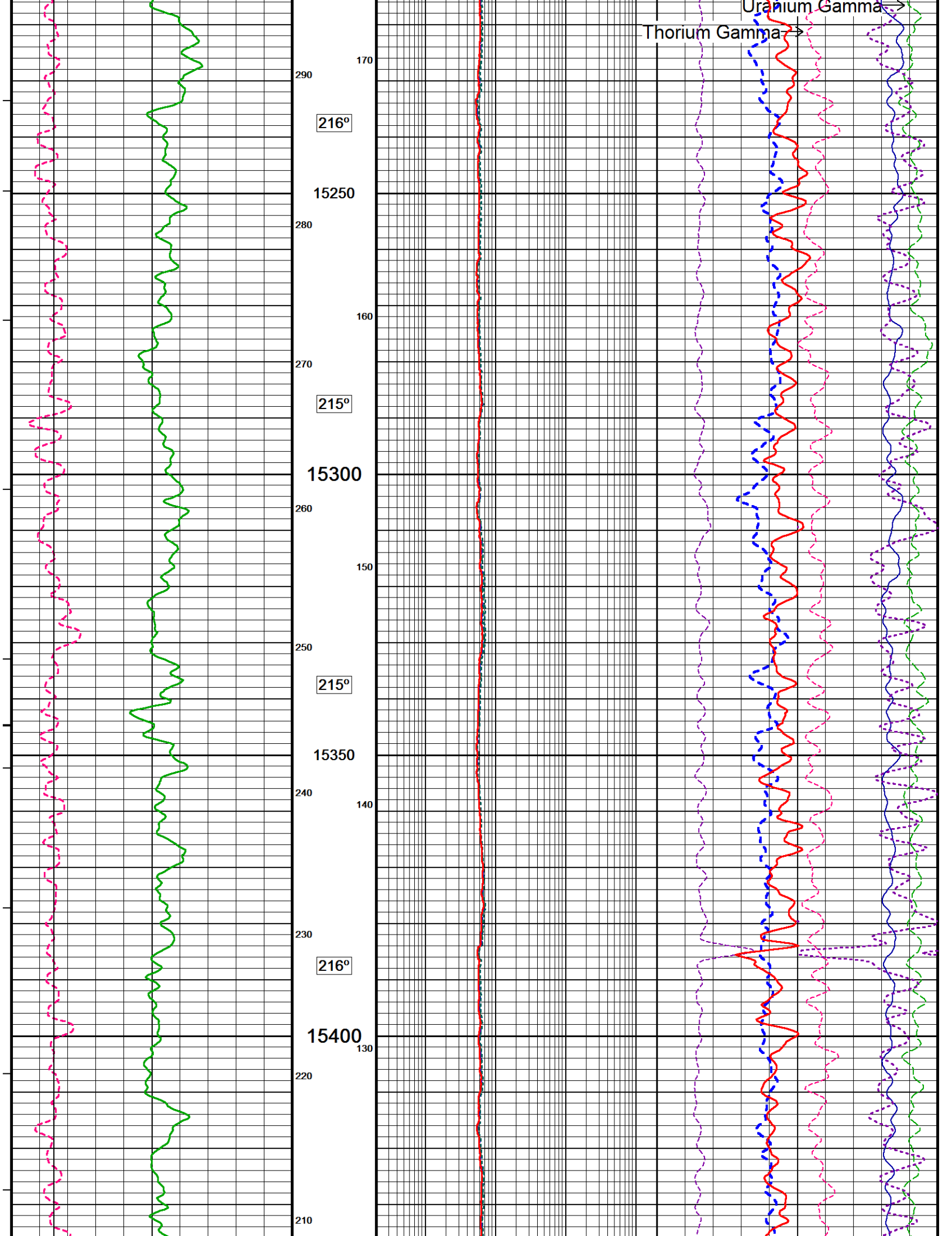


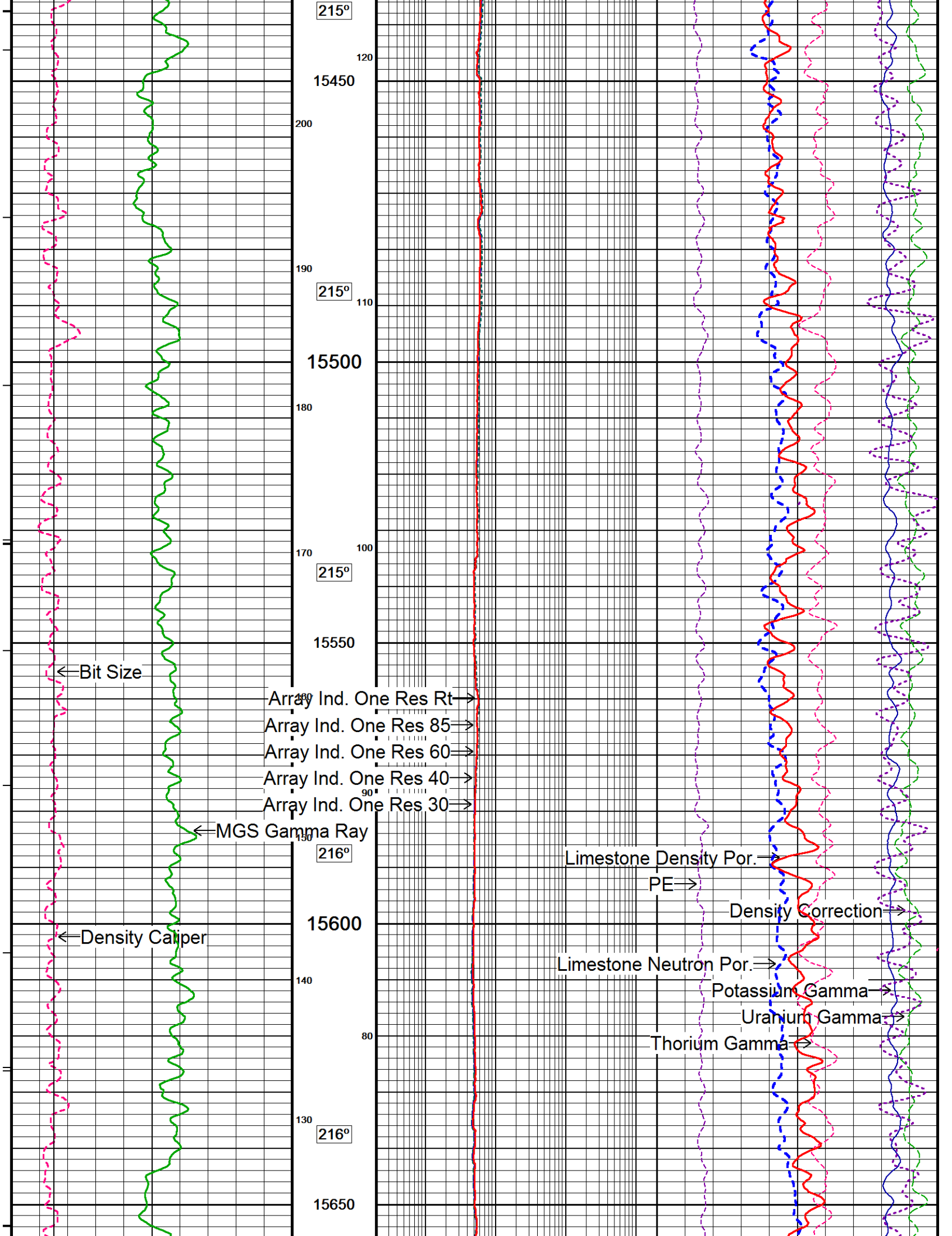


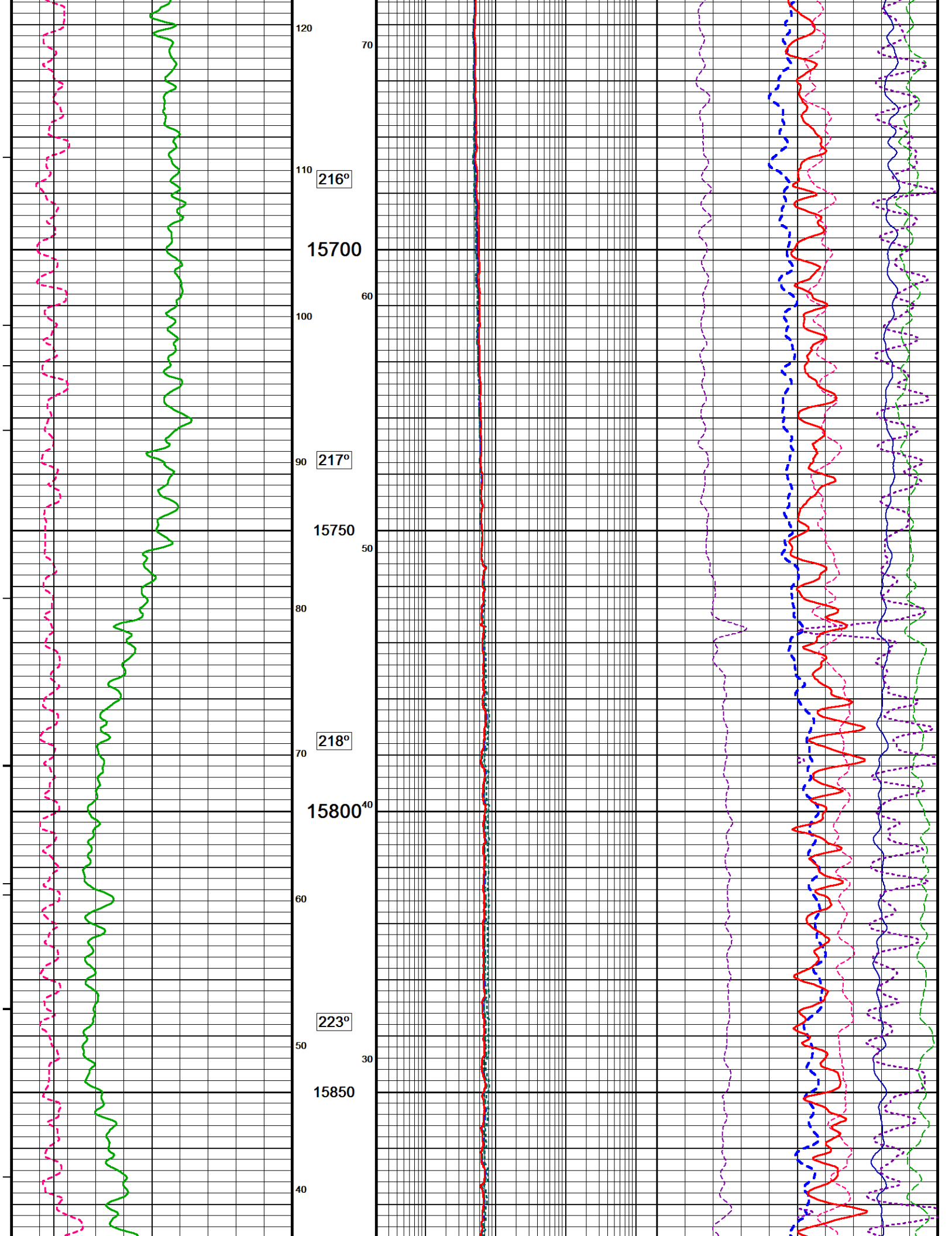


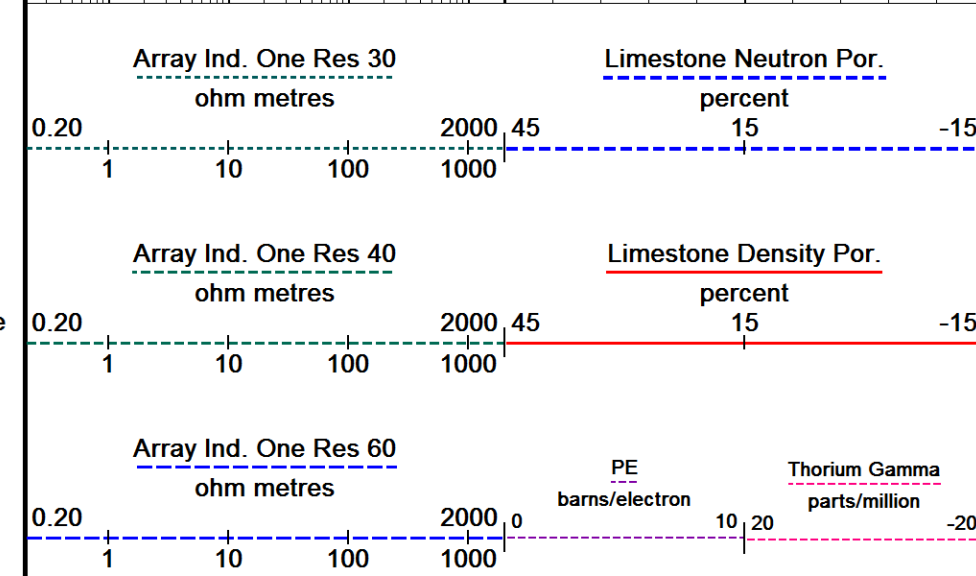
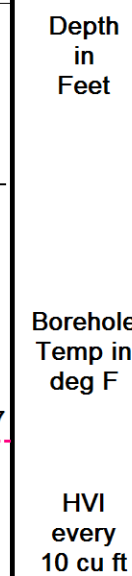
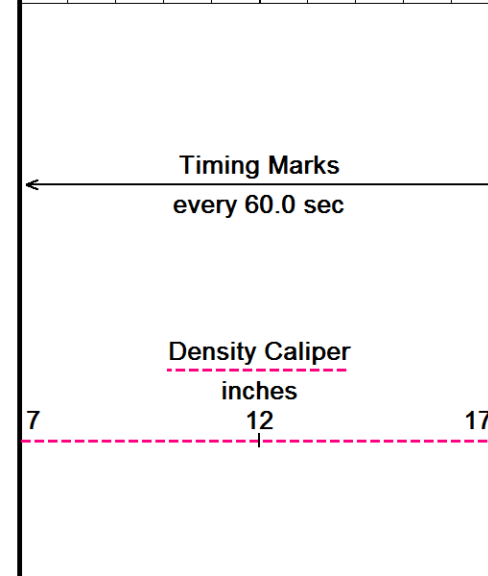
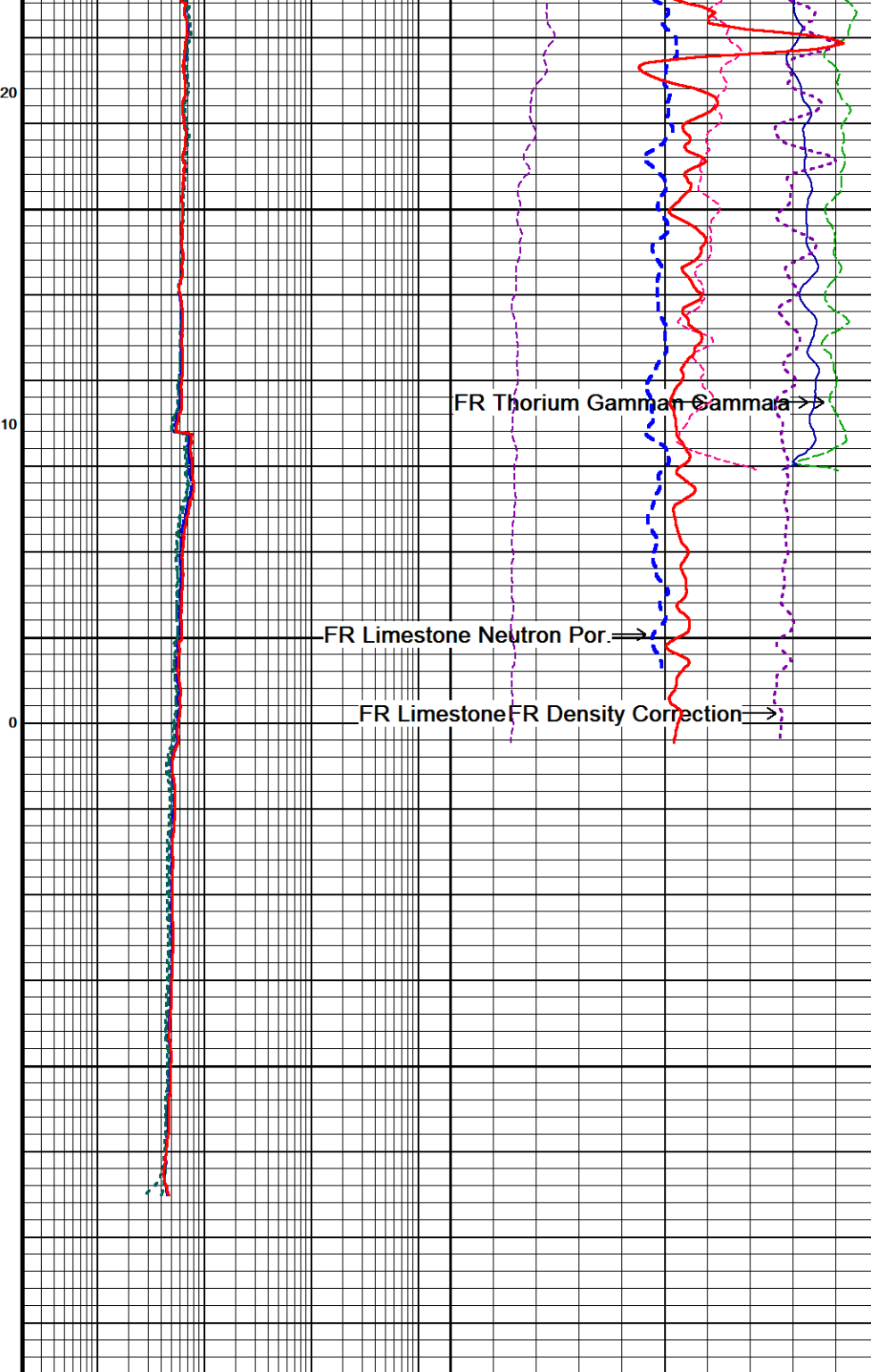
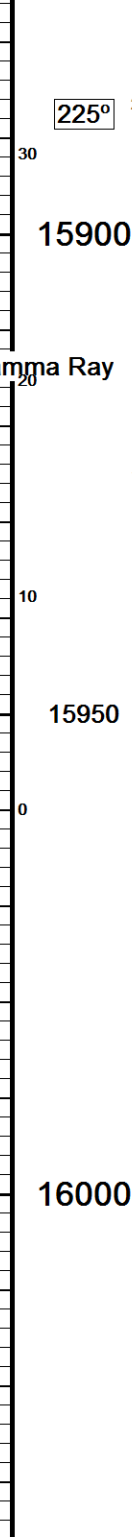
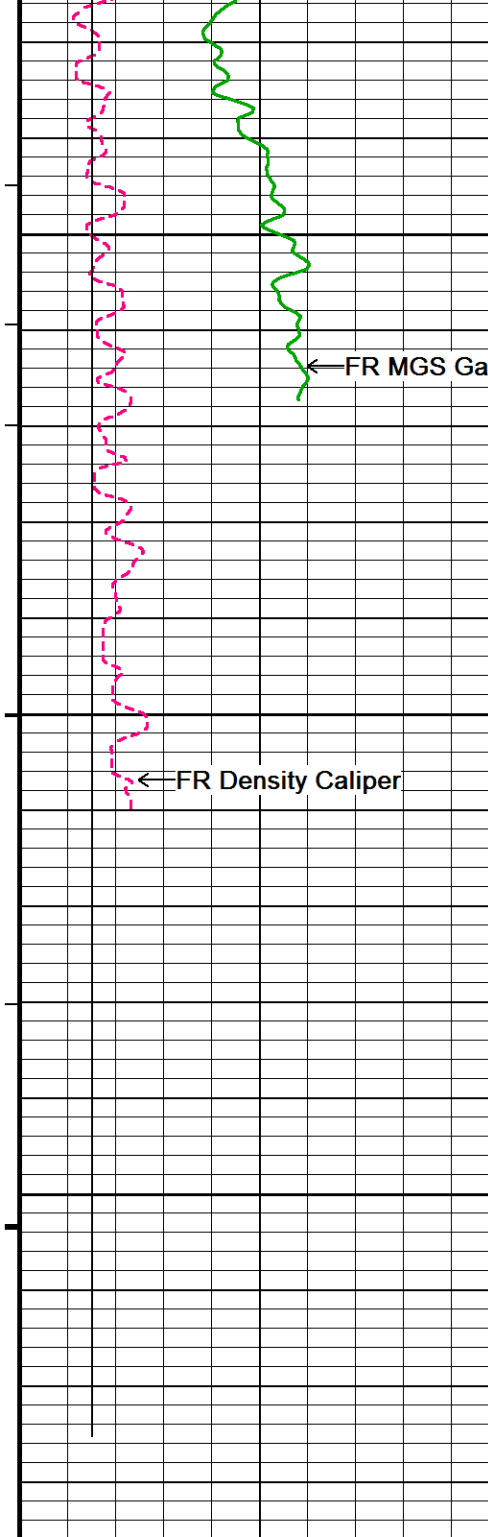


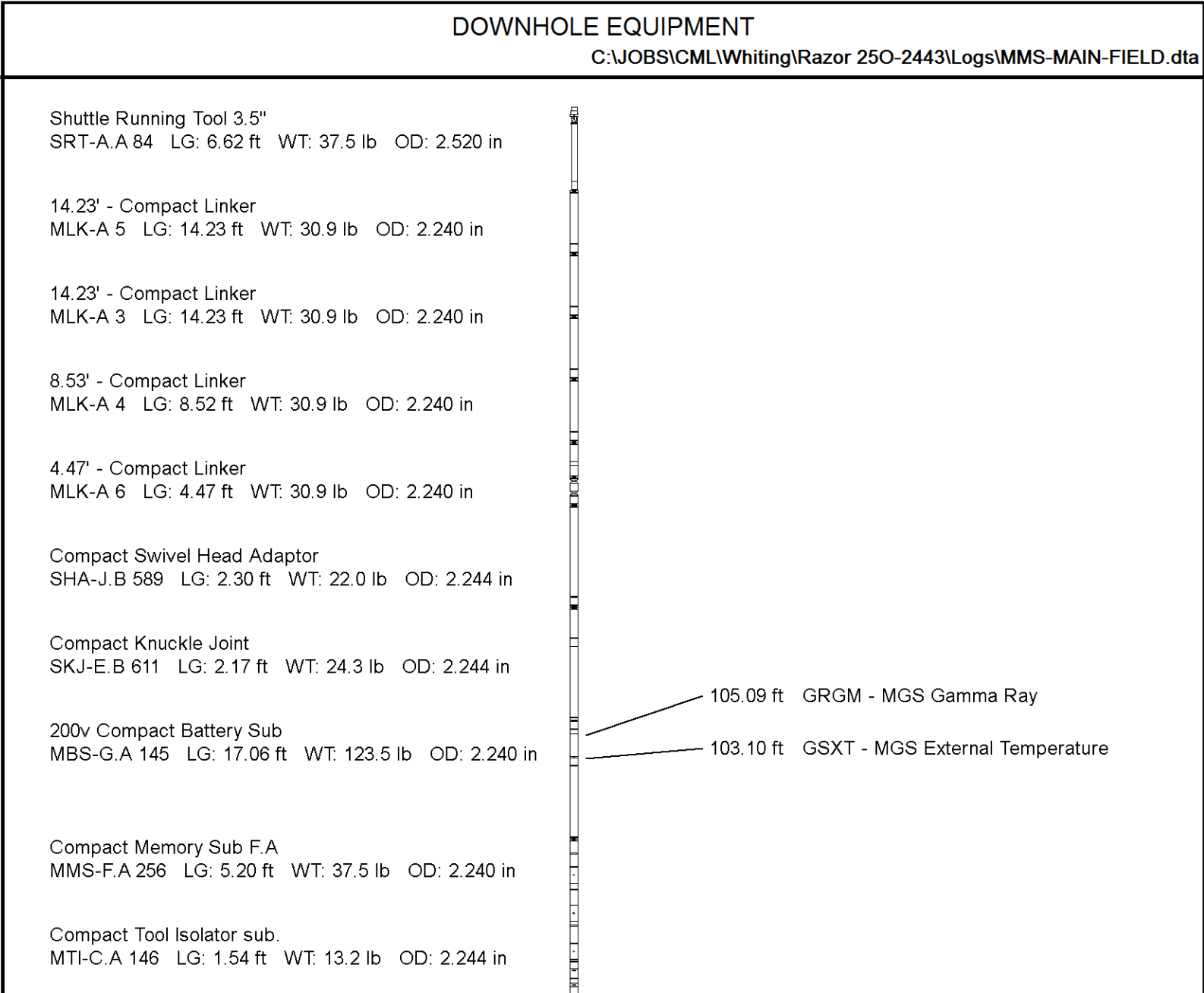
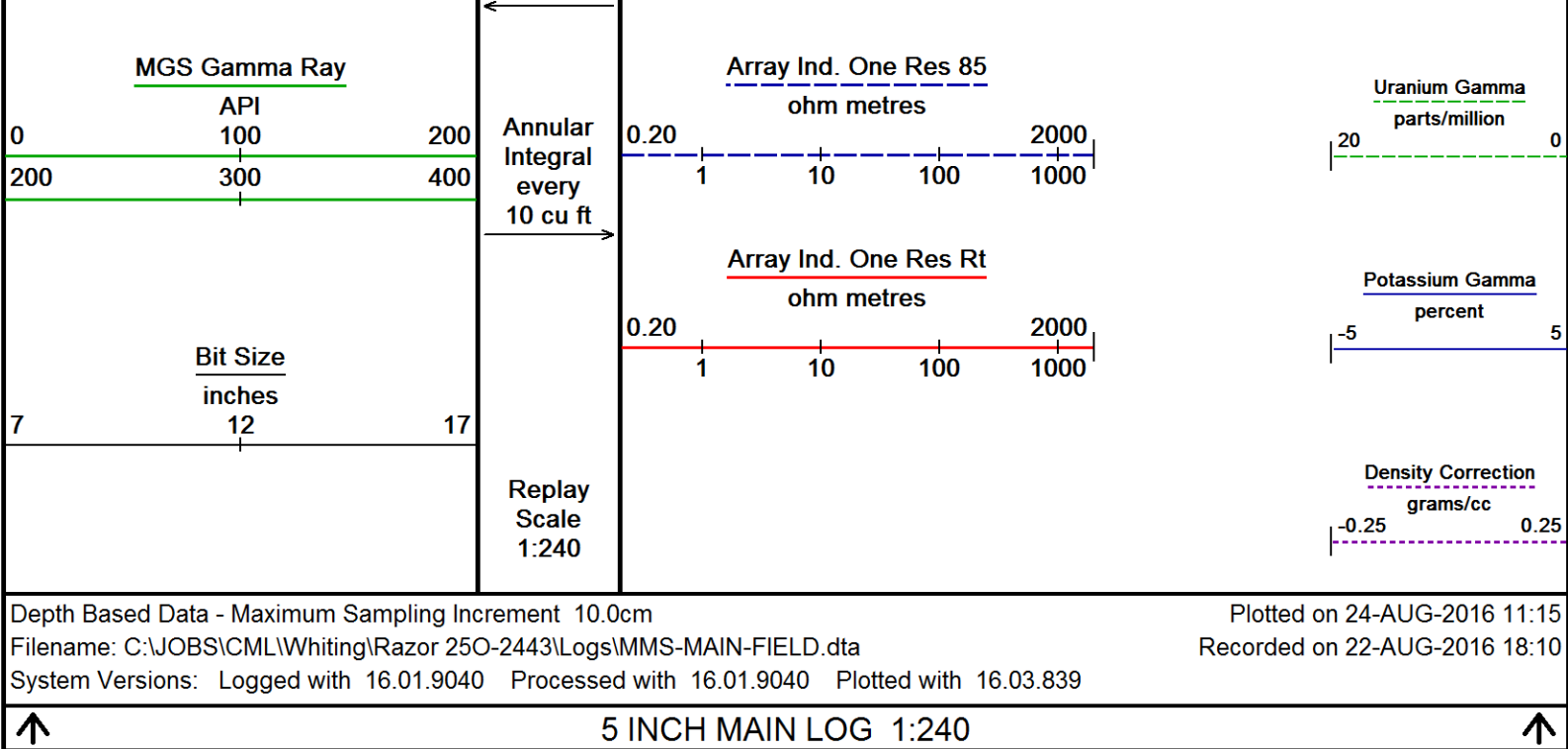












Compact Short Gamma
MGS-C.J 139 LG: 3.41 ft WT: 24.3 lb OD: 2.240 in

Compact Collar Locator
MCL-C.A 128 LG: 3.17 ft WT: 26.5 lb OD: 2.244 in

Compact Spectral Gamma
MSG-A.A 106 LG: 10.94 ft WT: 90.4 lb OD: 2.244 in

Compact Focussed Electric
MFE-C.A 404 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Knuckle Joint
SKJ-E.B 612 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

Compact Swivel Head Adaptor
SHA-J.B 573 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

Compact Inline Bowspring sub
MIS-D.B 734 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

Compact Neutron
MDN-C.A 462 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-C.J 380 LG: 9.59 ft WT: 90.4 lb OD: 2.244 in

Compact Vee Arm Caliper
MVC-A.A 141 LG: 8.06 ft WT: 61.7 lb OD: 2.244 in

Compact Swivel Head Adaptor
SHA-J.B 504 LG: 2.30 ft WT: 22.0 lb OD: 2.240 in

Compact Knuckle Joint
SKJ-E.A 203 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

Compact Inline Standoff sub
MIS-E.B 662 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in

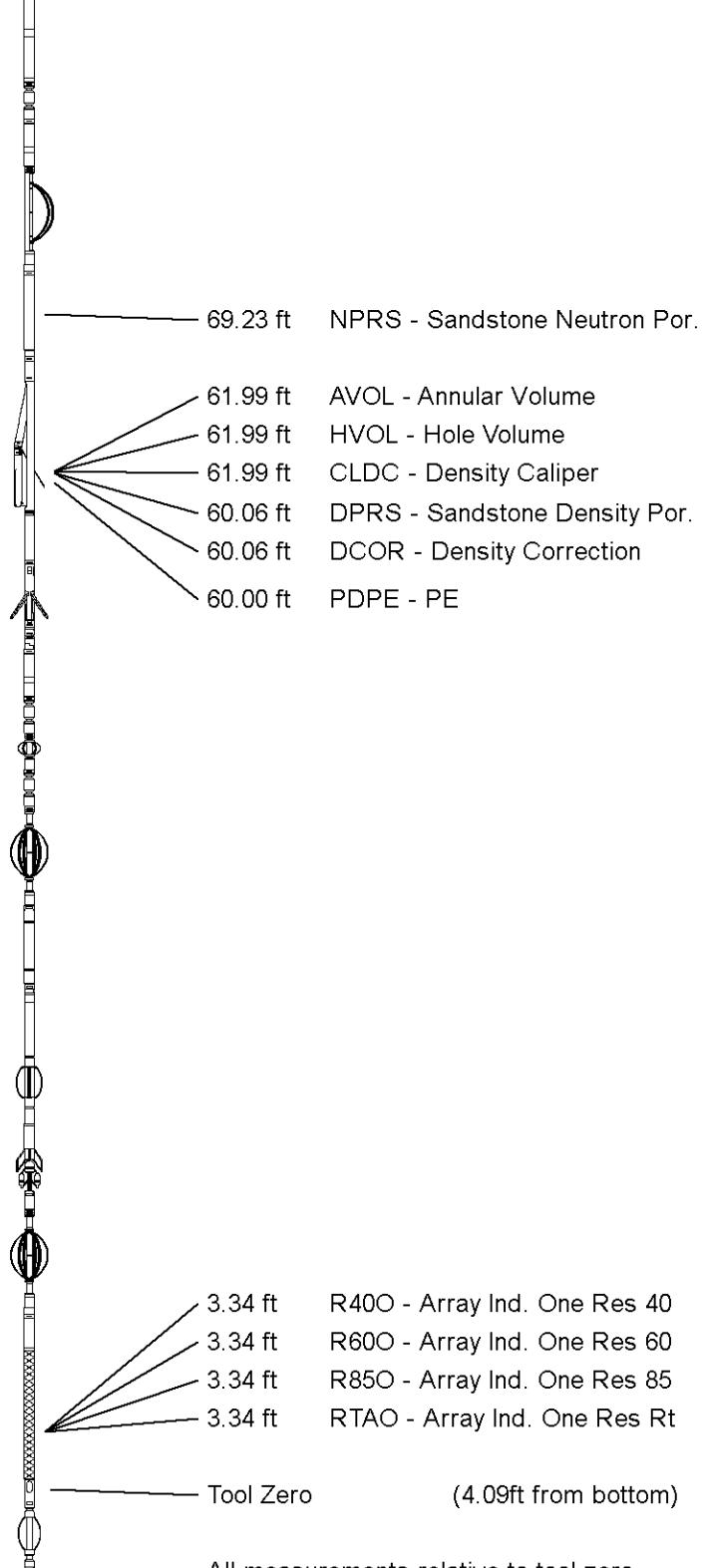
Compact Knuckle Joint
SKJ-E.B 588 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

Compact Inline Bowspring sub
MIS-D.B 731 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

Compact MMI Memory Section (HS)
MIM-D.A 300 LG: 4.65 ft WT: 26.5 lb OD: 2.244 in

Compact MMI Electrode Section (HS)
MIE-E.B 295 LG: 13.96 ft WT: 99.2 lb OD: 4.094 in

Compact Inline Bowspring sub
MIS-D.B 812 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in



Compact Induction
MAI-B.J 362 LG: 14.76 ft WT: 48.5 lb OD: 2.240 in

Total Length: 186.29 ft Weight: 1179.5 lb

BEFORE SURVEY CALIBRATION

C:\JOBS\CML\Whiting\Razor 25O-2443\Logs\MMS-MAIN-FIELD.dta

General Constants All 000

Last Edited on 22-AUG-2016,18:03

General Parameters

Mud Resistivity	0.918	ohm-metres
Mud Resistivity Temperature	103.800	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	

Hole/Annular Volume and Differential Caliper Parameters

HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	5.500	inches
Caliper for Differential Caliper	None	

Rwa Parameters

Porosity used	Base Density Porosity
Resistivity used	Deep Induction
RWA Constant A	0.610
RWA Constant M	2.150
SW/APOR Tool Source	0.000

Gamma Calibration MGS-C.J 139

Field Calibration on 21-JUL-2016 15:18

	Measured	Calibrated (API)
Background	56	37
Calibrator (Gross)	1421	949
Calibrator (Net)	1365	912

Gamma Calibration Tolerances MGS-C.J 139

Ratio	1.497	<div><div>1.40</div><div>1.475</div><div>1.55</div></div>	Counts/API
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Gamma Constants MGS-C.J 139

Last Edited on 22-AUG-2016,18:03

Gamma Calibrator Number	072	
GRC-M Calibrator Jig in Use?	NO	
Inactive Background Jig in Use?	NO	
Mud Density	1.28	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Potassium Equivalence	Chloride	
K Mud Concentration	0.00	%

High Resolution Temperature Calibration MGS-C.J 139

Field Calibration on 17-JUN-2016,14:23

	Measured	Calibrated(Deg F)
Lower	0.00	0.00
Upper	0.00	0.00

High Resolution Temperature Constants MGS-C.J 139

Last Edited on 17-JUN-2016,14:22

Pre-filter Length	11
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Neutron Calibration MDN-C.A 462

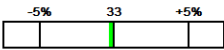
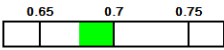
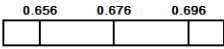
Base Calibration on 29-JUL-2016 16:17

Field Check on 29-JUL-2016 16:49

Base Calibration

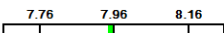
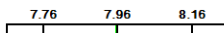
Measured	Calibrated (cps)
----------	------------------

	measured	Calibrated (cps)
	Near 2938	Far 89
	Near 3714	Far 110
Ratio	32.884	33.764
Field Calibrator at Base		Calibrated (cps)
		1395 2063
Ratio		0.676
Field Check		Calibrated (cps)
		1390 2056
Ratio		0.676

Neutron Calibration Tolerances MDN-C.A 462		
Ratio	32.884	
Base Check	0.676	
Field Check	0.676	

Neutron Constants MDN-C.A 462		Last Edited on 22-AUG-2016,18:05
Neutron Source Id	P44384B	
Neutron Jig Number	6532NK	
Air Hole Processing	Modified Ratio	
Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches
Mud Density	1.00	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	7.00	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	None	
Formation Pressure	N/A	kpsi
Temperature Source	None	
Temperature	N/A	degrees F
Mud Salinity	0.00	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	None	
Formation Fluid Salinity	N/A	kppm
Barite Mud Correction	Not Applied	

Caliper Calibration MIE-E.B 295				Base Calibration on 05-JUL-2016 13:56	
				Field Calibration on 05-JUL-2016 13:58	
Base Calibration					
Reading No	Pads 1-5 Meas.	Pads 3-7 Meas.	Calibrator Size (in)		
1	25629	25388	5.96		
2	36634	35917	7.96		
3	46024	45579	9.85		
4	57150	56869	11.88		
5	0	0	0.00		
Reading No	Pad 2 Meas.	Pad 4 Meas.	Pad 6 Meas.	Pad 8 Meas.	Calibrator Size (in)
1	25125	22643	23319	24347	5.96
2	33047	32719	33509	32916	7.96
3	41631	40635	41671	41338	9.85
4	51373	50186	51321	51117	11.88
5	0	0	0	0	0.00
Field Calibration					
	Measured	Measured	Actual		
	Pads 1-5 Caliper(in)	Pads 3-7 Caliper(in)	Caliper(in)		
	7.94	7.95	7.96		
	Measured	Measured	Measured	Measured	Actual
	Pad 2 Caliper(in)	Pad 4 Caliper(in)	Pad 6 Caliper(in)	Pad 8 Caliper(in)	Caliper(in)
	3.98	3.97	4.00	3.98	7.96

Caliper Calibration Tolerances MIE-E.B 295		
Upper		
Sh. A - X-Field	7.94	
Sh. A - X-Field	7.95	

Short Arm X Field Cal.		7.94	<div><div></div><div></div><div></div><div></div><div></div></div>	in	Short Arm Y Field Cal.		7.95	<div><div></div><div></div><div></div><div></div><div></div></div>	in
Lower									
Short Arm X Field Cal.		7.97	<div><div></div><div></div><div></div><div></div><div></div></div>	in	Short Arm Y Field Cal.		7.95	<div><div></div><div></div><div></div><div></div><div></div></div>	in
Caliper Constants MIE-E.B 295					Last Edited on 05-JUL-2016,13:49				
Caliper Difference for BRKT		0.120		inches					
Accelerometer Parameters MIE-E.B 295									
Date Of Last Accelerometer Calibration		15-MAR-2016,13:07							
Slope		X Accelerometer	-1.096277	Y Accelerometer	-1.099558	Z Accelerometer	-1.102114		
Offset		0.006628		0.005772		0.005928			
Accelerometer Constants MIE-E.B 295					Last Edited on 05-JUL-2016,13:48				
Accelerometer Calibrator Number		000							
Accelerometer Temperature Characterisation									
X Accelerometer									
Serial Number		1405							
Calibration Date		14-Mar-2014							
		B0	B1	B2	B3				
Bias(g)		0.00000e+000	1.66163e-005	-3.06549e-009	7.43311e-011				
		SF0	SF1	SF2	SF3				
Scale Factor(mA/g)		3.00000e+000	2.81522e-004	2.27019e-007	9.98143e-010				
Y Accelerometer									
Serial Number		1402							
Calibration Date		03-Feb-2014							
		B0	B1	B2	B3				
Bias(g)		0.00000e+000	9.90066e-006	-3.82380e-008	3.03634e-010				
		SF0	SF1	SF2	SF3				
Scale Factor(mA/g)		3.00000e+000	2.84328e-004	2.74294e-007	8.70508e-010				
Z Accelerometer									
Serial Number		1412							
Calibration Date		19-Mar-2014							
		B0	B1	B2	B3				
Bias(g)		0.00000e+000	-5.26750e-007	6.42785e-009	1.20224e-010				
		SF0	SF1	SF2	SF3				
Scale Factor(mA/g)		3.00000e+000	2.64759e-004	3.27972e-007	1.24296e-009				
Magnetometer Parameters MIE-E.B 295									
Date Of Last Magnetometer Calibration		16-MAR-2016,15:31							
Slope		X Magnetometer	-1.000000	Y Magnetometer	-0.999603	Z Magnetometer	-0.987414		
Offset		-0.014019		-0.015957		0.039309			
Magnetometer Constants MIE-E.B 295					Last Edited on				
Magnetometer Calibrator Number		000							
Navigation Constants MIE-E.B 295					Last Edited on 22-AUG-2016,19:30				
Magnetic Declination		7.80		degrees		East			
Imager Pad Check MIE-E.B 295					Field Check on 05-JUL-2016 14:12				
Pad 1	20/20 Buttons Verified	Pad 5	20/20 Buttons Verified						
Pad 2	24/24 Buttons Verified	Pad 6	24/24 Buttons Verified						
Pad 3	20/20 Buttons Verified	Pad 7	20/20 Buttons Verified						
Pad 4	24/24 Buttons Verified	Pad 8	24/24 Buttons Verified						
Compact Micro Imager Constants MIE-E.B 295					Last Edited on 22-AUG-2016,18:06				
Sonde Configuration		Imager Mode							
Arm-Pad Kit		Normal Pads (12.25 in)							
Arm-Pad Kit Serial Number		N/A							
Centre Pad 1 Rotational Offset		0.00		degrees					

Image/Borehole Ovality Reference	Relative Bearing High Side	
Non Active Buttons	Omit	
Search Angle	0.00	degrees
Correlation Interval	3.28	feet
Correlation Step	1.64	feet
Current Offset	0.0000	mAmp
Squasher Start	0.0500	mAmp
Image Processing	Enabled	

Induction Calibration MAI-B.J 362

Base Calibration on 17-SEP-2015,08:39

Field Check on 20-AUG-2016 09:29

Base Calibration

Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel		Low	High	Low	High
1		16.0	468.7	9.3	966.2
2		6.2	374.5	7.6	821.4
3		3.6	258.3	5.2	566.0
4		1.8	133.1	2.6	279.2

Array Temperature 74.8 Deg F

Test Loop Calibration Verified 29-JUL-2016 14:34

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	18.2	3871.8	15.4	3872.6
2	32.5	3602.9	30.6	3604.2
3	30.1	3066.7	28.5	3067.5
4	20.8	2077.1	19.7	2077.8
Deep	18.6	1952.4	17.5	1952.7
Medium	43.1	4073.6	41.1	4074.8
Shallow	48.6	5396.6	45.7	5398.9

Array Temperature 82.7 68.0 Deg F

Induction Calibration Tolerances MAI-B.J 362

Low Conductivity 1	16.0		mmho/m High Conductivity 1	468.7		mmho/m
Low Conductivity 2	6.2		mmho/m High Conductivity 2	374.5		mmho/m
Low Conductivity 3	3.6		mmho/m High Conductivity 3	258.3		mmho/m
Low Conductivity 4	1.8		mmho/m High Conductivity 4	133.1		mmho/m
Background Vx 1	0.0		mmho/m Phase Check Loop 1	0.0		%
Background Vx 2	0.0		mmho/m Phase Check Loop 2	0.0		%
Background Vx 3	0.0		mmho/m Phase Check Loop 3	0.0		%
Background Vx 4	0.0		mmho/m Phase Check Loop 4	0.0		%

Induction Constants MAI-B.J 362

Last Edited on 22-AUG-2016,19:36

Induction Model		RtAP-WBM	
Borehole Correction Constants			
Tool Centred		Yes	
Hole Size Source	Density Caliper		
Hole Size Constant Value		N/A	inches
Stand-off Type		N/A	
Stand-off		N/A	inches
Number of Fins on Stand-off		N/A	
Stand-off Fin Angle		N/A	degrees
Stand-off Fin Width		N/A	inches
Rm Source	Global Value: Temperature Corrected		
Temp. for Rm Corr.	MGS External Temperature		
Squasher Start		0.0020	mhos/metre
Squasher Offset		N/A	mhos/metre

Borehole Normalisation

DRM1	0.0000	DRC1	0.0000
DRM2	0.0000	DRC2	0.0000

MRM1	0.0000	MRC1	0.0000
MRM2	0.0000	MRC2	0.0000
SRM1	0.0000	SRC1	0.0000
SRM2	0.0000	SRC2	0.0000

Calibration Site Corrections

Channel 1	0.00	mmhos/metre
Channel 2	0.00	mmhos/metre
Channel 3	0.00	mmhos/metre
Channel 4	0.00	mmhos/metre

Symmetrised Receiver Gains

Receiver 1	1.00
Receiver 2	1.00
Receiver 3	1.00
Receiver 4	1.00

Apparent Porosity and Water Saturation Constants

Archie Constant (A)	1.00	
Cementation Exponent (M)	2.00	
Saturation Exponent (N)	2.00	
Saturation of Water for Apor	100.00	percent
Resistivity of Water for Apor and Sw	0.05	ohm-m
Resistivity of Mud Filtrate for Sw	0.00	ohm-m
Source for Rt	0.00	
Source for Rxo	0.00	

Compact Spectral Gamma Calibration MSG-A.A 106

Base Calibration on 23-JUN-2016 13:57

Field Calibration on 23-JUN-2016 15:46

Base Calibration

Gamma Ray

	Measured	Calibrated (API)
Background	67	29
Calibrator (Gross)	690	300
Calibrator (Net)	623	271

Mixture Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	54.3	8.7	2.4	0.7	1.1
Calibrator (Gross)	546.9	96.0	29.0	7.9	10.1
Calibrator (Net)	492.6	87.4	26.6	7.2	9.1

	K %	U ppm	Th ppm
Concentrations	5.9	13.6	43.7

Potassium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	54.3	8.7	2.4	0.7	1.1
Calibrator (Gross)	127.6	38.0	16.0	0.7	1.0
Calibrator (Net)	73.3	29.3	13.6	-0.1	-0.0

	K %	U ppm	Th ppm
Concentrations	5.8	0.0	0.0

Uranium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	54.3	8.7	2.4	0.7	1.1
Calibrator (Gross)	330.2	46.5	11.2	5.9	2.7
Calibrator (Net)	275.9	37.8	8.9	5.2	1.6

	K %	U ppm	Th ppm
Concentrations	0.0	17.8	0.0

Thorium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	54.3	8.7	2.4	0.7	1.1
Calibrator (Gross)	250.0	36.0	7.4	3.9	8.9
Calibrator (Net)	195.7	27.4	5.0	3.2	7.8

	K %	U ppm	Th ppm
Concentrations	0.0	0.0	46.3

Field @ Base Calibration

Calibration Type

440

450

Gamma Ray

	Measured	Calibrated (API)
Background	67.1	29.2
Calibrator (Gross)	689.9	300.4
Calibrator (Net)	622.8	271.2

Mixture Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	54.3	8.7	2.4	0.7	1.1
Calibrator (Gross)	546.9	96.0	29.0	7.9	10.1
Calibrator (Net)	492.6	87.4	26.6	7.2	9.1

Field Calibration

Calibration Type	SG Jigs
SGB Calibrator Serial Number	440
SGM Calibrator Serial Number	450

Gamma Ray

	Measured	Calibrated (API)
Background	62.3	27.2
Calibrator (Gross)	684.7	298.4
Calibrator (Net)	622.4	271.2

Mixture Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	50.1	8.3	2.3	0.6	1.0
Calibrator (Gross)	542.2	96.0	28.6	7.8	10.1
Calibrator (Net)	492.1	87.7	26.3	7.2	9.1

Compact Spectral Gamma Calibration Tolerances MSG-A.A 106

Base Check K	6.03		%	Field @ Base Check K	0.00		%
Base Check U	14.33		ppm	Field @ Base Check U	0.00		ppm
Base Check T	45.85		ppm	Field @ Base Check T	0.00		ppm
Field Check K	6.01		%				
Field Check U	14.34		ppm				
Field Check T	45.84		ppm				

Compact Spectral Gamma Constants MSG-A.A 106

Last Edited on 22-AUG-2016,18:04

Background Calibrator Number	440	
Mixture Calibrator Number	450	
Potassium Calibrator Number	500	
Uranium Calibrator Number	506	
Thorium Calibrator Number	503	
Mud Density	1.28	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Potassium Equivalence	Chloride	
K Mud Concentration	0.00	%

Caliper Calibration MPD-C.J 380

Base Calibration on 29-JUL-2016 15:18

Field Calibration on 20-AUG-2016,09:25

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13776	3.98
2	22048	5.96
3	30528	7.97
4	38577	9.84
5	47858	11.91
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.92	7.97

Caliper Calibration Tolerances MPD-C.J 380

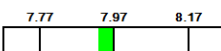
Short Arm Field Cal. 7.92  in

Photo Density Calibration MPD-C.J 380

Base Calibration on 29-JUL-2016 15:03
Field Check on 29-JUL-2016 15:10

Density Calibration Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Background	1258	1411		
Reference 1	53289	25798	59443	30683
Reference 2	22882	2624	24540	2525

Field Check at Base
1258.0 1410.9

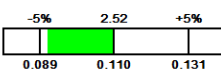

Field Check
1260.0 1416.3

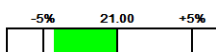
PE Calibration Base Calibration	Measured			Calibrated Ratio
	WS	WH	Ratio	
Background	229	1136		
Reference 1	22697	53110	0.432	0.372
Reference 2	6512	22750	0.291	0.271

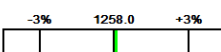
Field Check at Base
228.5 1135.5

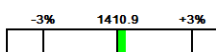
Field Check
227.4 1136.0

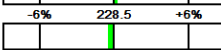
Photo Density Calibration Tolerances MPD-C.J 380

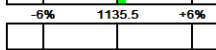
Near Density Ratio 2.41 
PE Calibration 0.131 

Far Density Ratio 20.10 

Near Den. Field Check 1260.0 

Far Den. Field Check 1416.3 

PE WS Field Check 227.4 

PE WH Field Check 1136.0 


Density Constants MPD-C.J 380

Last Edited on 22-AUG-2016,18:06

Density Source Id	P50562B	
Nylon Calibrator Number	DNC.E.652	
Aluminium Calibrator Number	DAC.C.631	
Density Shoe Profile	4 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.28	gm/cc
Mud Density Z/A Multiplier	1.11	
Mud Filtrate Density	1.00	gm/cc
Dry Hole Mud Filtrate Density	1.00	gm/cc
DNCT	0.00	gm/cc
CRCT	0.00	gm/cc
Density Z/A Correction	Hybrid	
Precision Enhanced Density Processing	Not Applied	
Matrix Density (gm/cc)	Depth (ft)	
2.68	3950.00	
2.78	4140.00	
2.68	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	

COMPANY	WHITING OIL AND GAS CORPORATION		
WELL	RAZOR 250-2443		
FIELD	WILDCAT		
PROVINCE/COUNTY	WELD		
COUNTRY/STATE	U.S.A./ COLORADO		

Elevation Kelly Bushing	4738.7	feet	First Reading	16015.00	feet
Elevation Drill Floor	4738.7	feet	Depth Driller	16040.00	feet
Elevation Ground Level	4717.7	feet	Depth Logger	16040.00	feet


Weatherford®

COMPOSITE LOG

RESISTIVITY - POROSITY

INDUCTION - SPECTRAL GAMMA