



Weatherford[®]

**CML MESSENGER SHUTTLE
SPECTRAL GAMMA RAY
LOG**

COMPANY SANDRIDGE ENERGY

WELL UNRUH 2629 1-17H

FIELD MONGER

PROVINCE/COUNTY GRAY

COUNTRY/STATE USA / KANSAS

**LOCATION SHL: 220' FSL & 400' FWL
BHL: 330' FNL & 400' FWL**

SEC 17

TWP 26S

RGE 29W

**Other Services
MPD/MDN
MA/MI/FE**

API Number 15-069-20387-01

Permit Number

Permanent Datum G.L., Elevation 2760 feet

Log Measured From DF

Drilling Measured From D.F. @ 20 FEET

Elevations:
KB 2780.00 feet
DF 2780.00
GL 2760.00

Date 10-SEP-2012

Run Number ONE

Depth Driller 9320.00 feet

Depth Logger 9320.00 feet

First Reading 9315.00 feet

Last Reading 3500.00 feet

Casing Driller 5364.00 feet

Casing Logger 5364.00 feet

Bit Size 6.125 inches

Hole Fluid Type WATER

Density / Viscosity 9.00 lb/USg 34.00 CP

PH / Fluid Loss 8.00 15.60 ml/30Min

Sample Source FLOWLINE

Rm @ Measured Temp 1.50 @ 80.0 ohm-m

Rmf @ Measured Temp 1.20 @ 80.0 ohm-m

Rmc @ Measured Temp 1.80 @ 80.0 ohm-m

Source Rmf / Rmc CALC CALC

Rm @ BHT 0.96 @ 124.0 ohm-m

Time Since Circulation 0 HOURS

Max Recorded Temp 124.00 deg F

Equipment Name COMPACT

Equipment / Base 18006 OKC

Recorded By D. ROWELL

Witnessed By W. SCOTT

S.O.# / AFE 3531693 / DC12325

BOREHOLE RECORD

Last Edited: 10-SEP-2012 08:30

Bit Size inches	Depth From feet	Depth To feet
6.125	5364.00	9320.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
INTERMED	7.000	0.00	5364.00	26.00

REMARKS

LOGGED WITH WLS VER 13.03 SOFTWARE

WELL LOGGED USING MESSENGER METHOD OF DEPLOYMENT, AND MEMORY LOGGING SYSTEM

HARDWARE: MAI: ISA STANDOFF BELOW
MPD: 4"PROFILE PLATE, MIS-A SINGLE SPRING DECENTRALIZER BELOW
MDN: MISD DOUBLE SPRING DECENTRALIZER RAN ABOVE

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER REQUEST

DRILL PIPE DEPTH DURING DEPLOYMENT - 9215
LOGGING TOOL DEPTH AFTER DEPLOYMENT: 9315

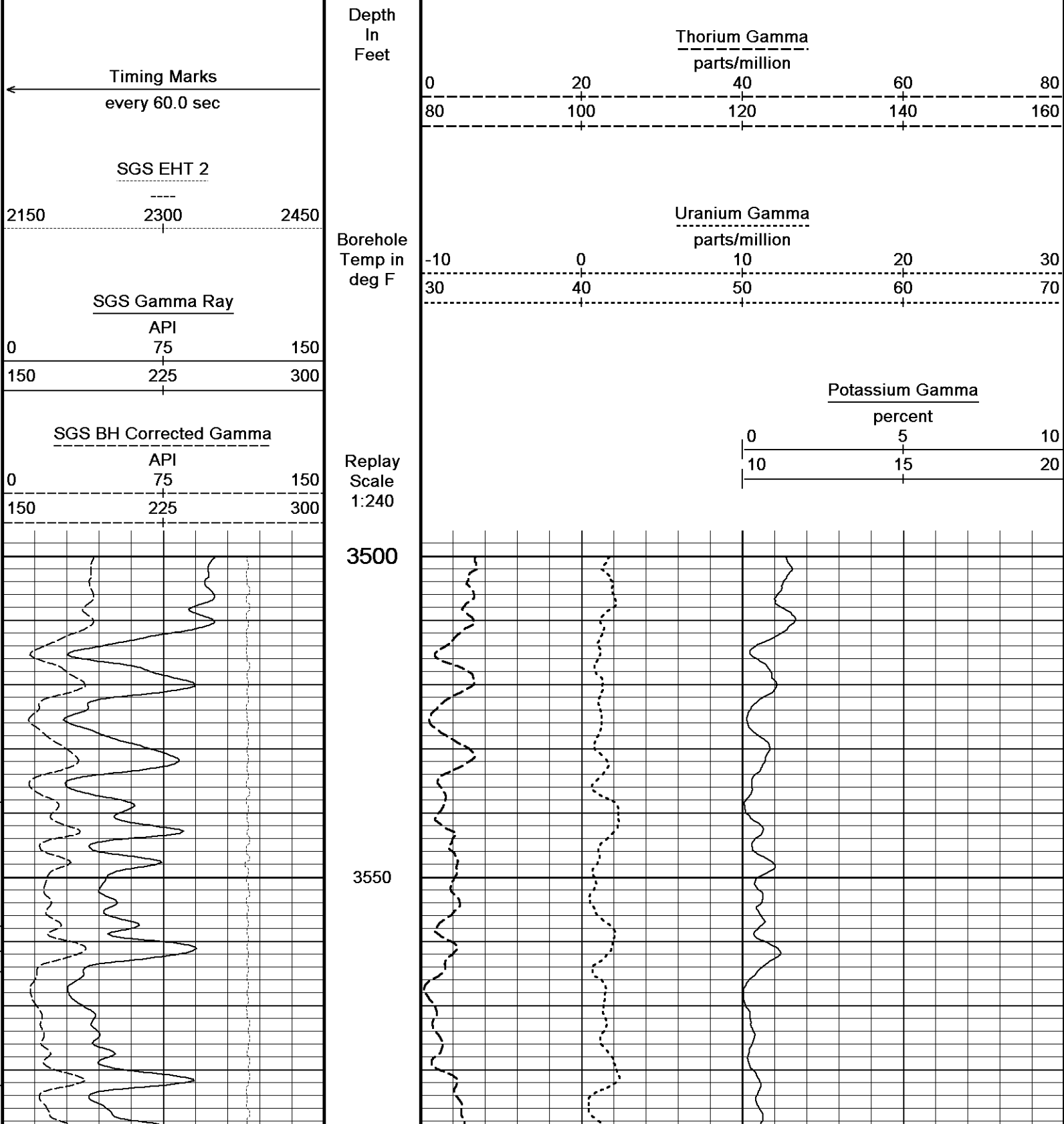
SERVICE ORDER # 3531693
RIG: LARIAT 20

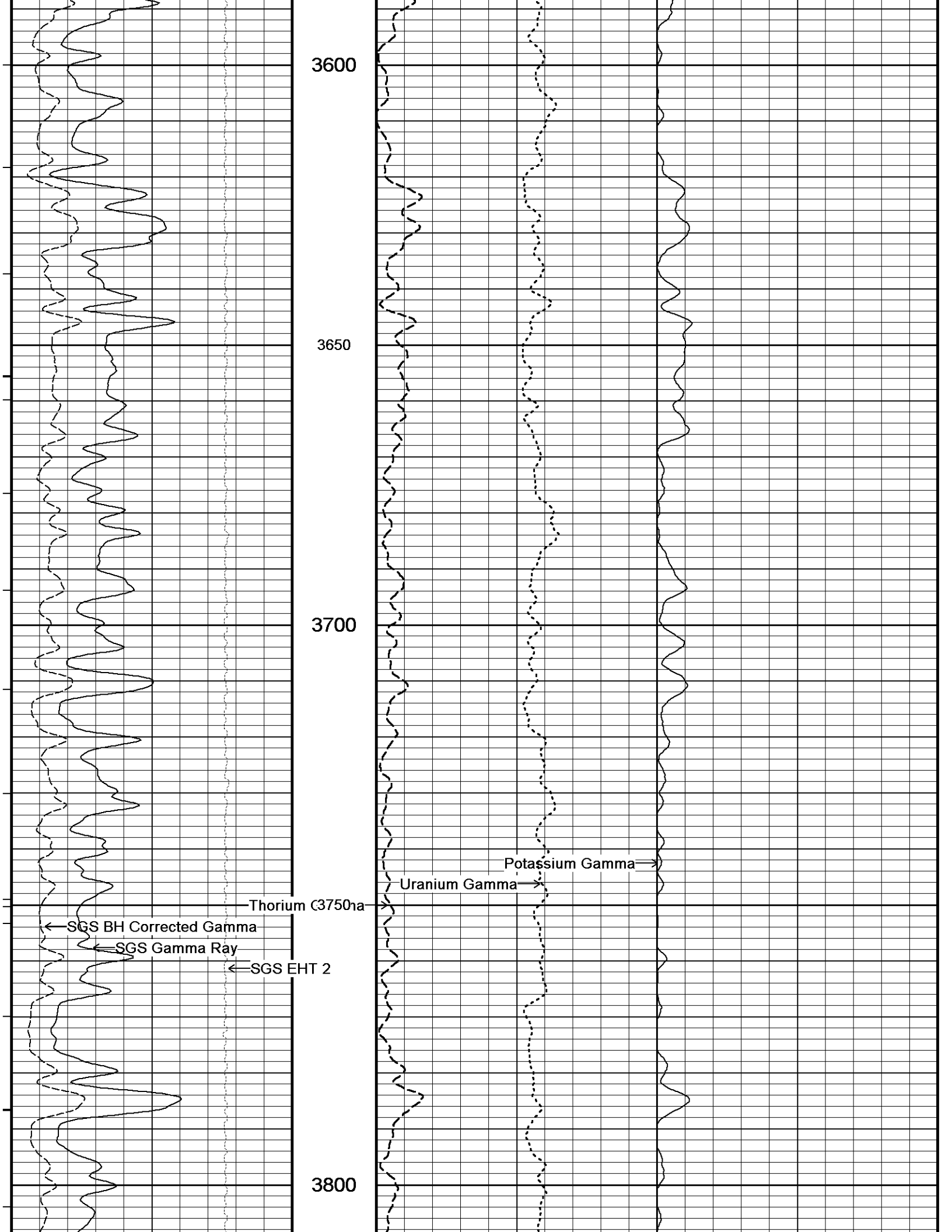
OPERATORS: R BRADSHAW B BALLINGER

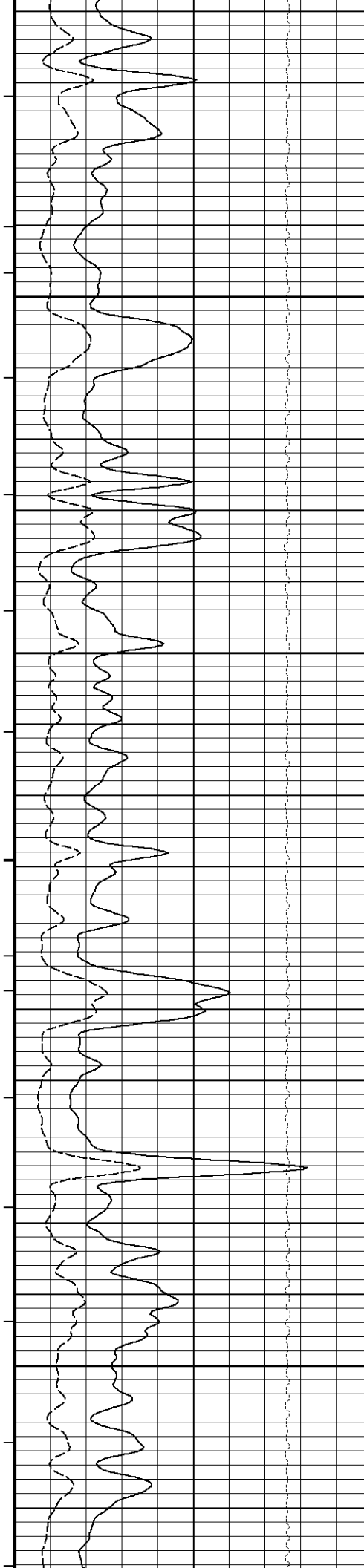
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions in our price schedule.

DSC

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 10-SEP-2012 10:57
 Filename: C:\Minimus 13.03.7779\Data\SDRGE (UNRUH 2629 1-17H)\34701 RTAP.dta Recorded on 10-SEP-2012 10:17
 System Versions: Processed with 13.03.7779 Plotted with 13.03.7779





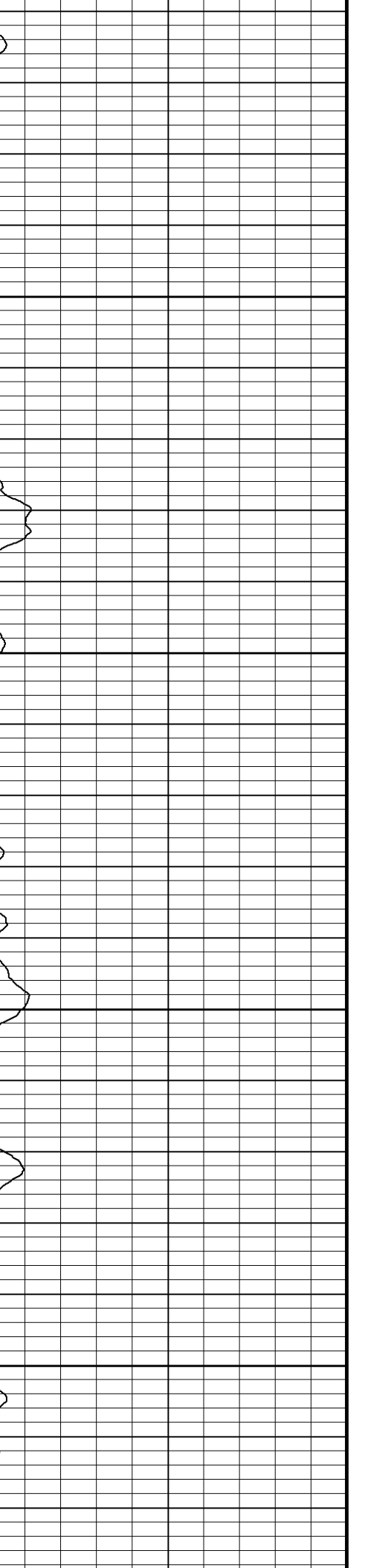
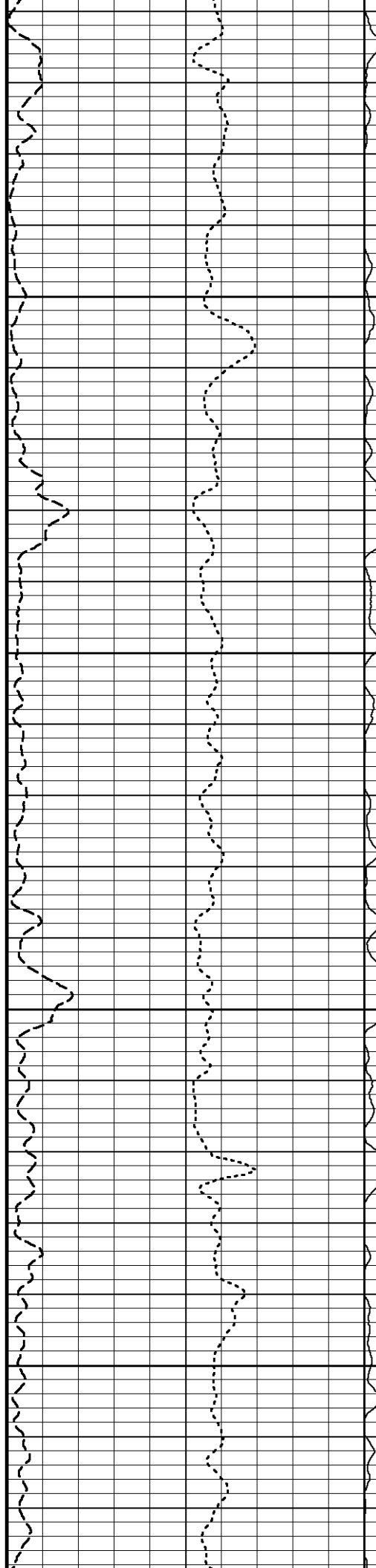


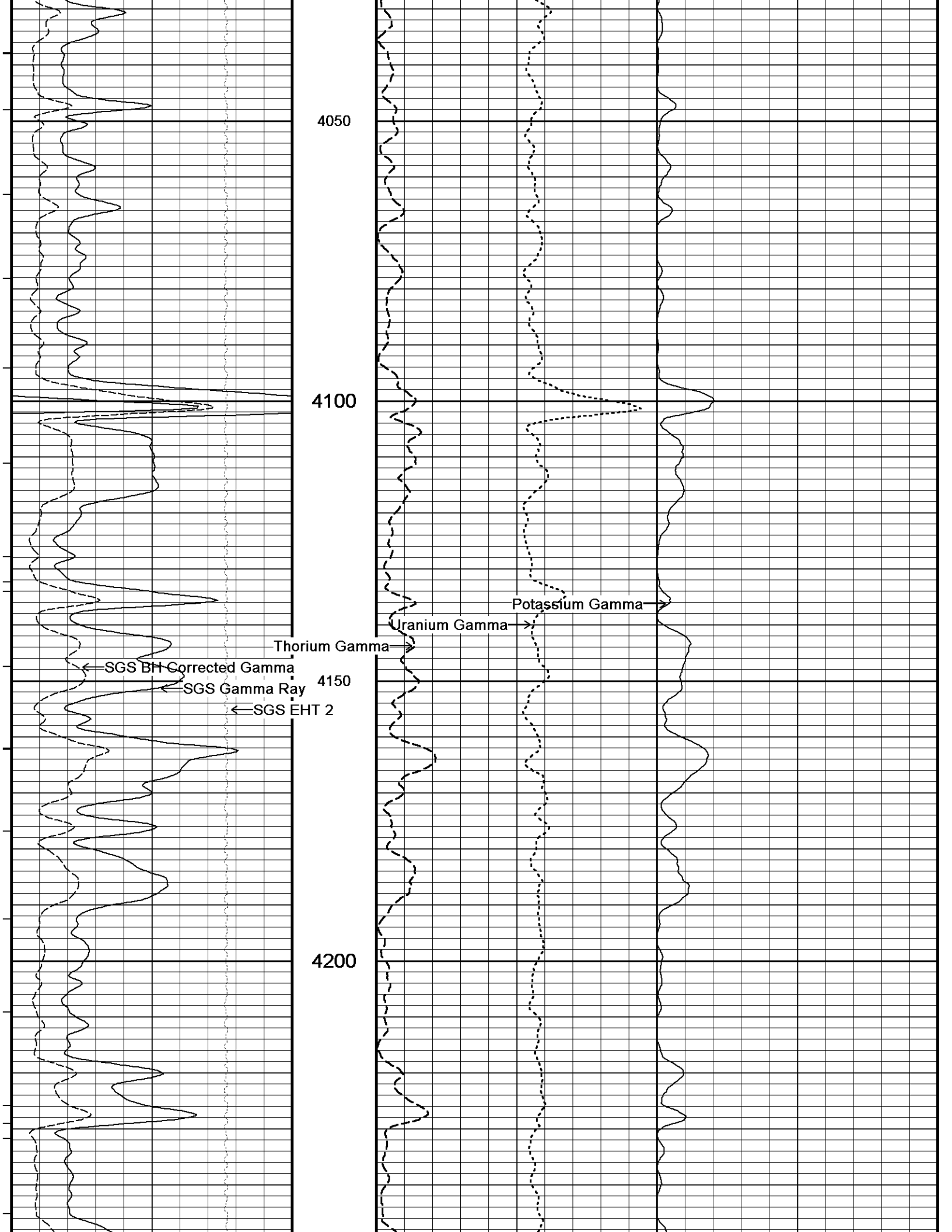
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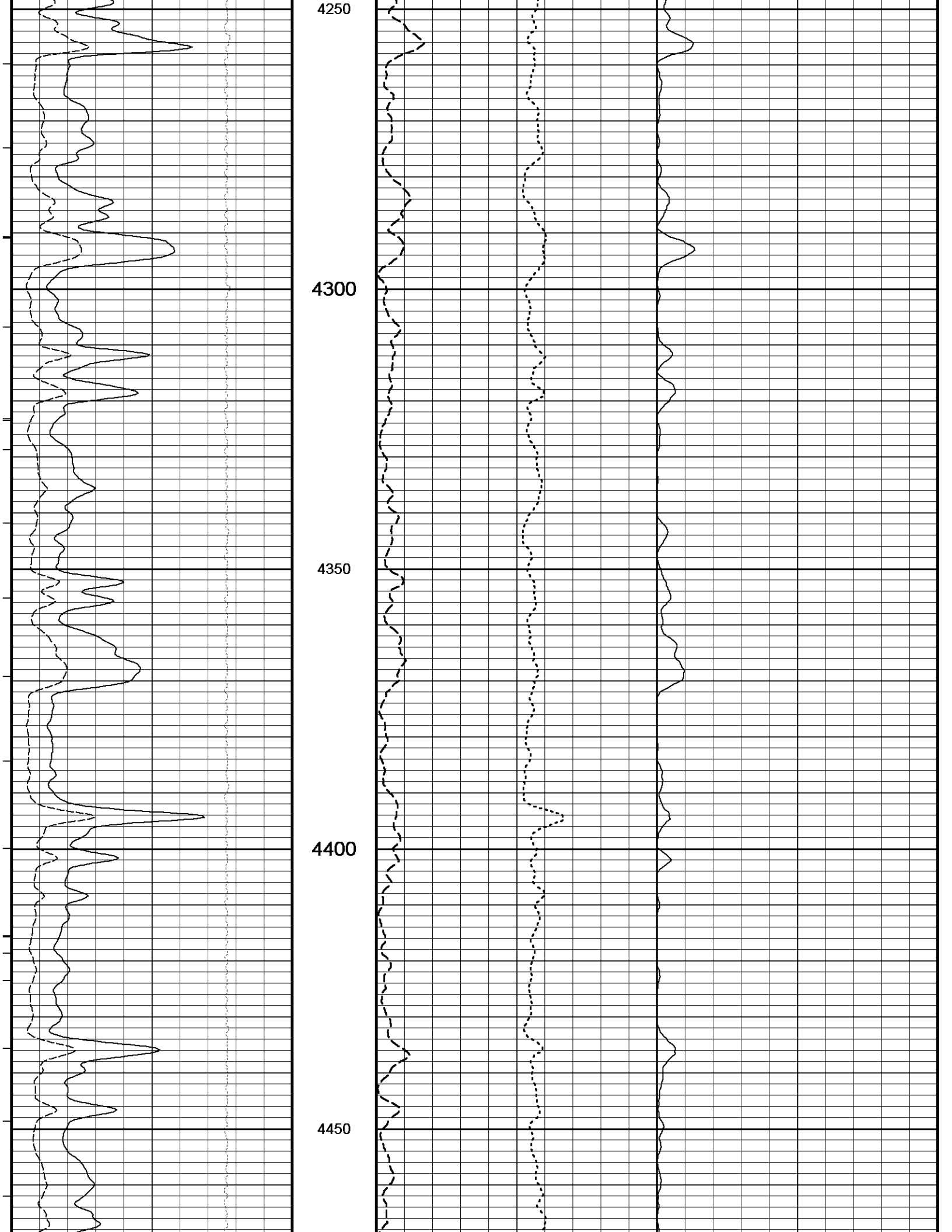
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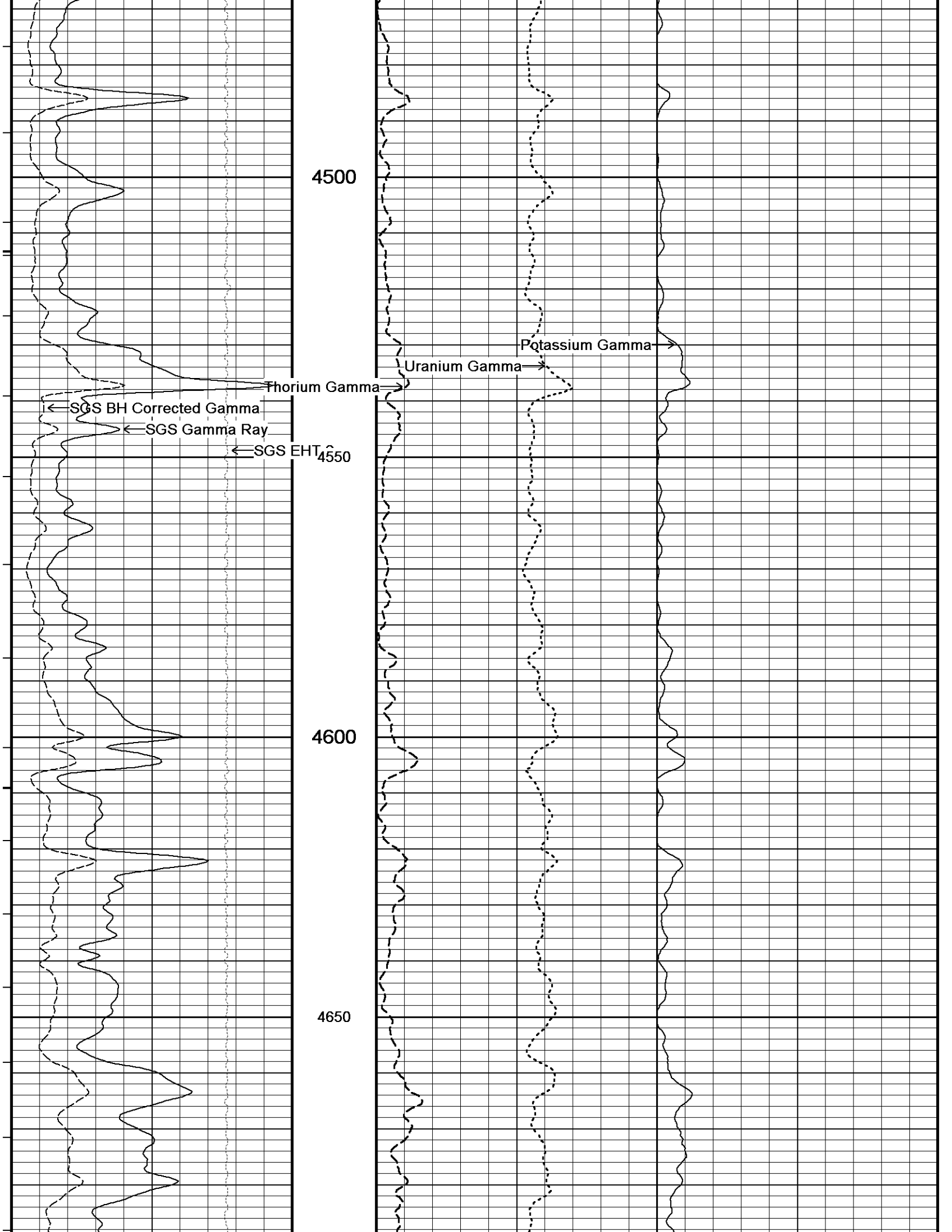
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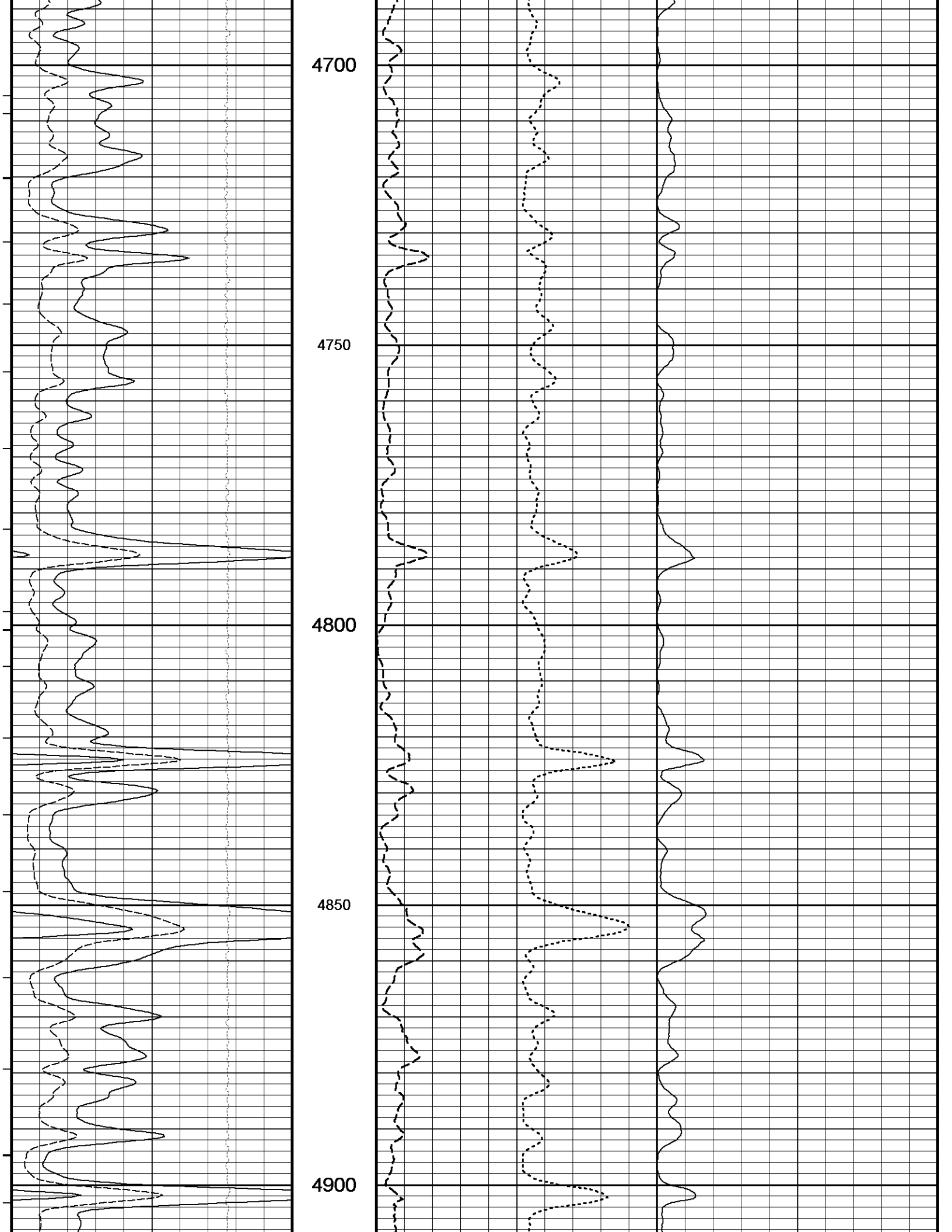
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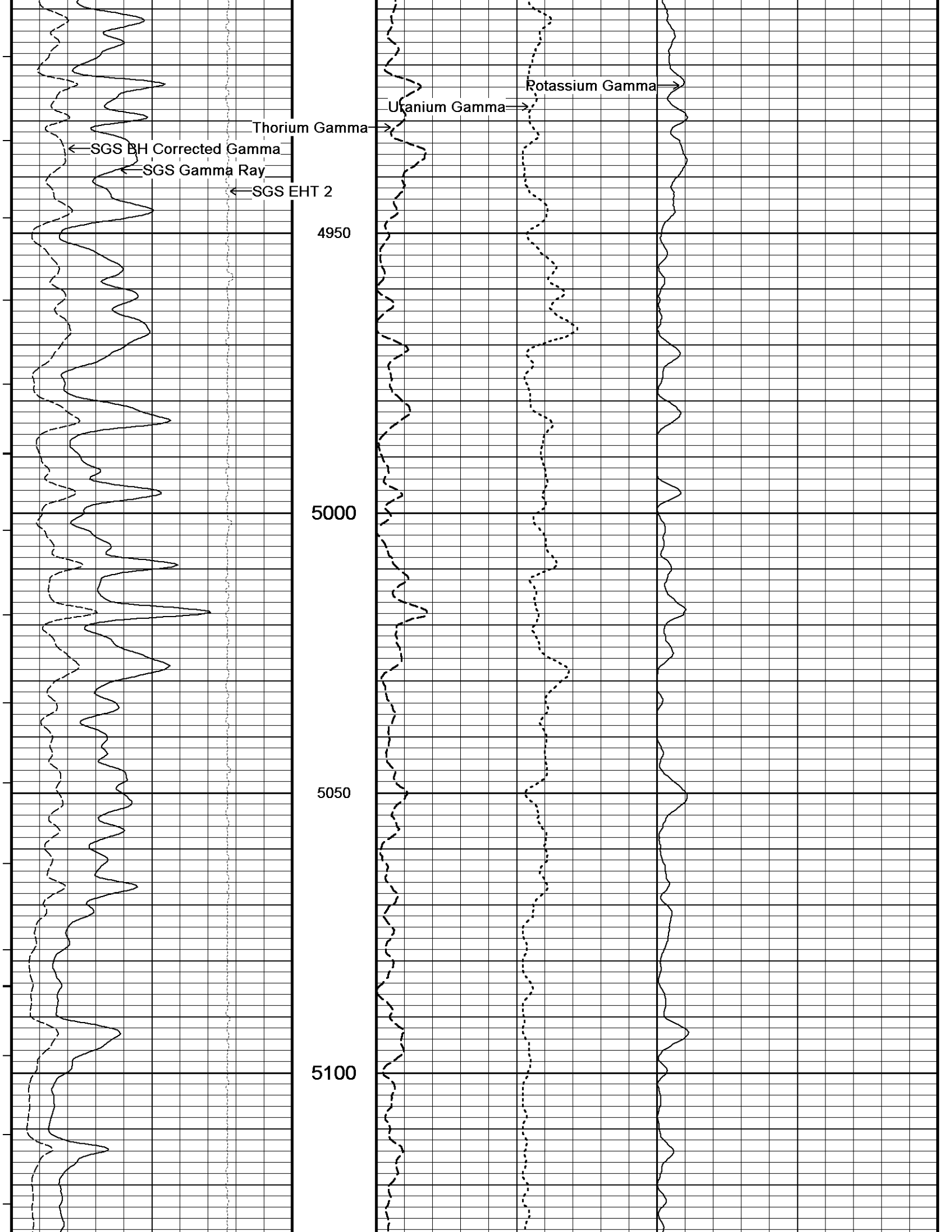


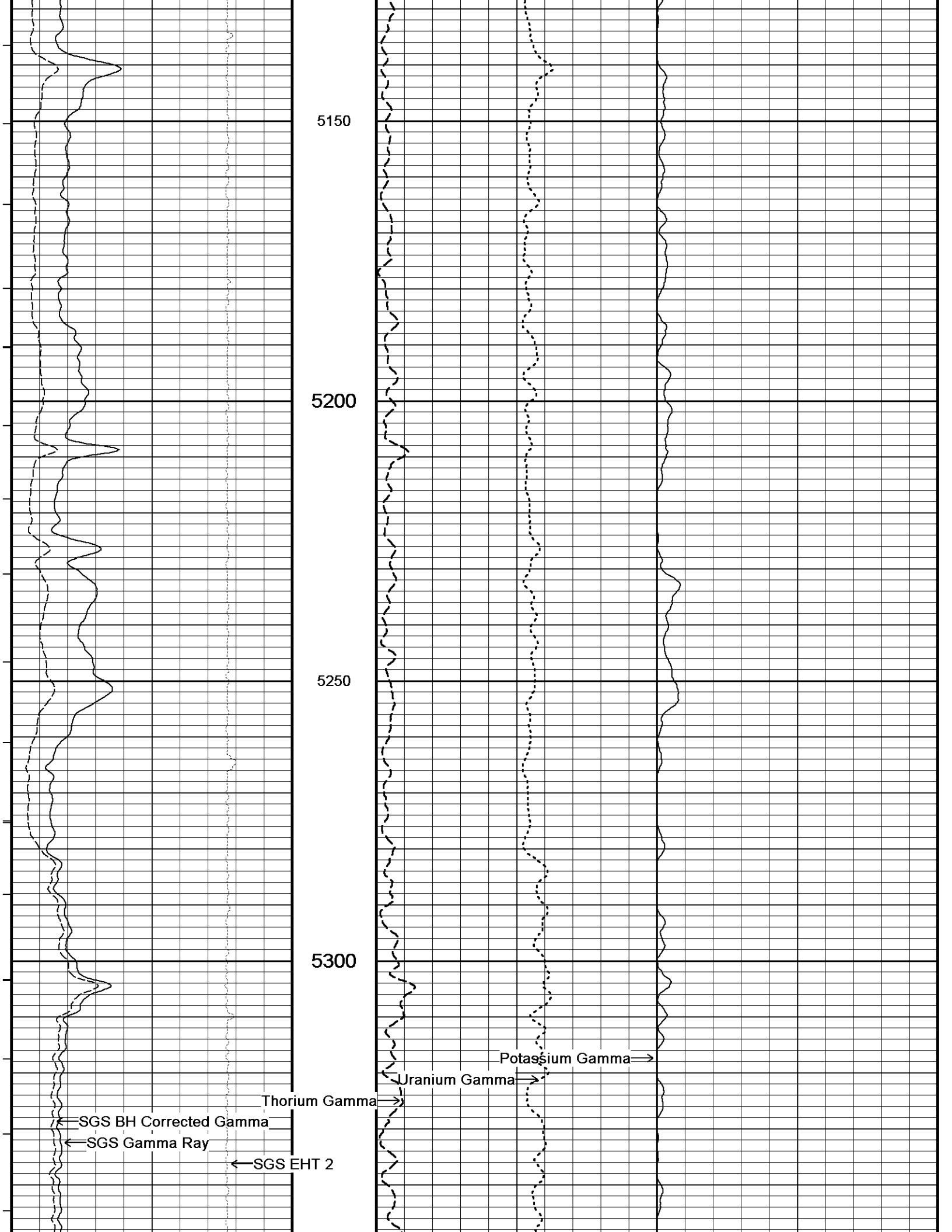


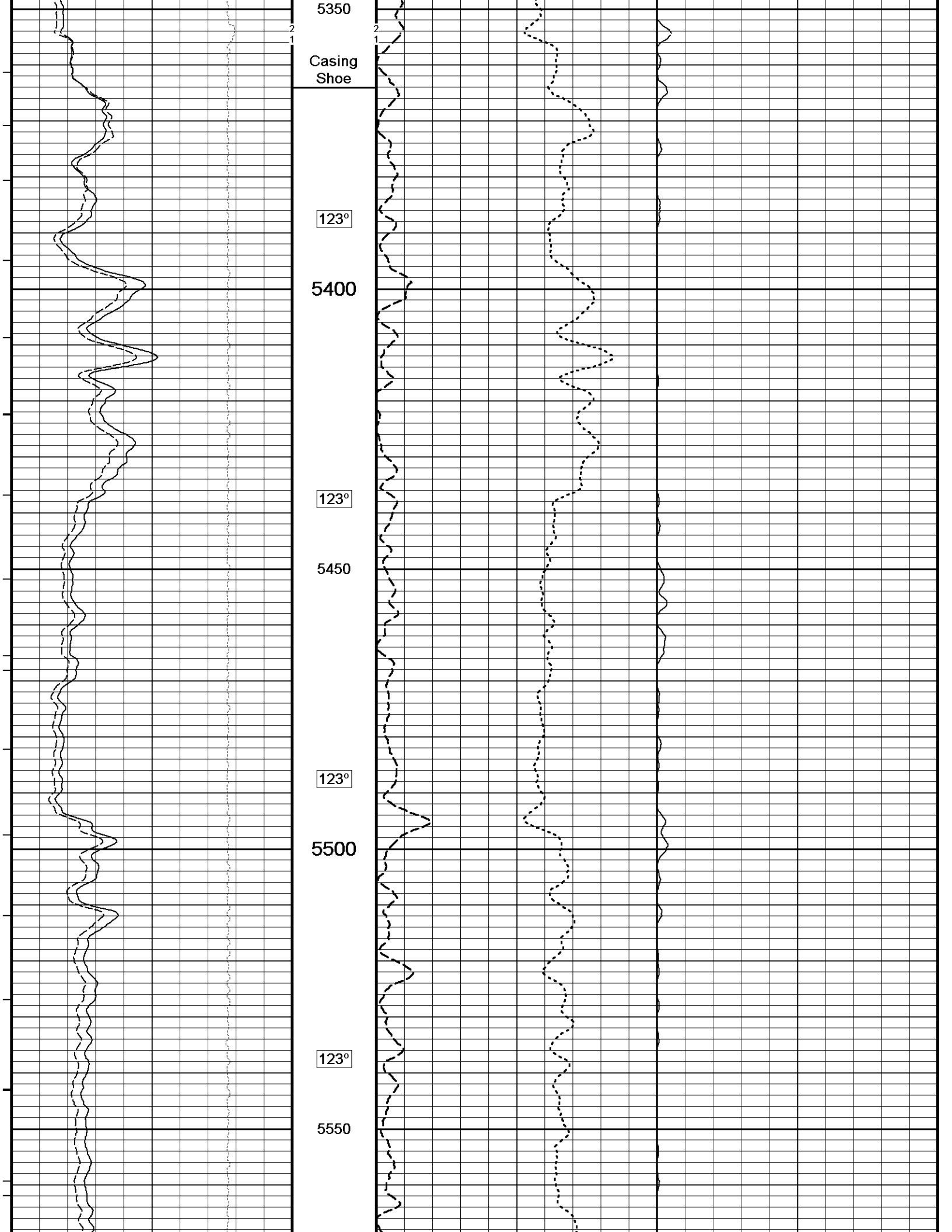


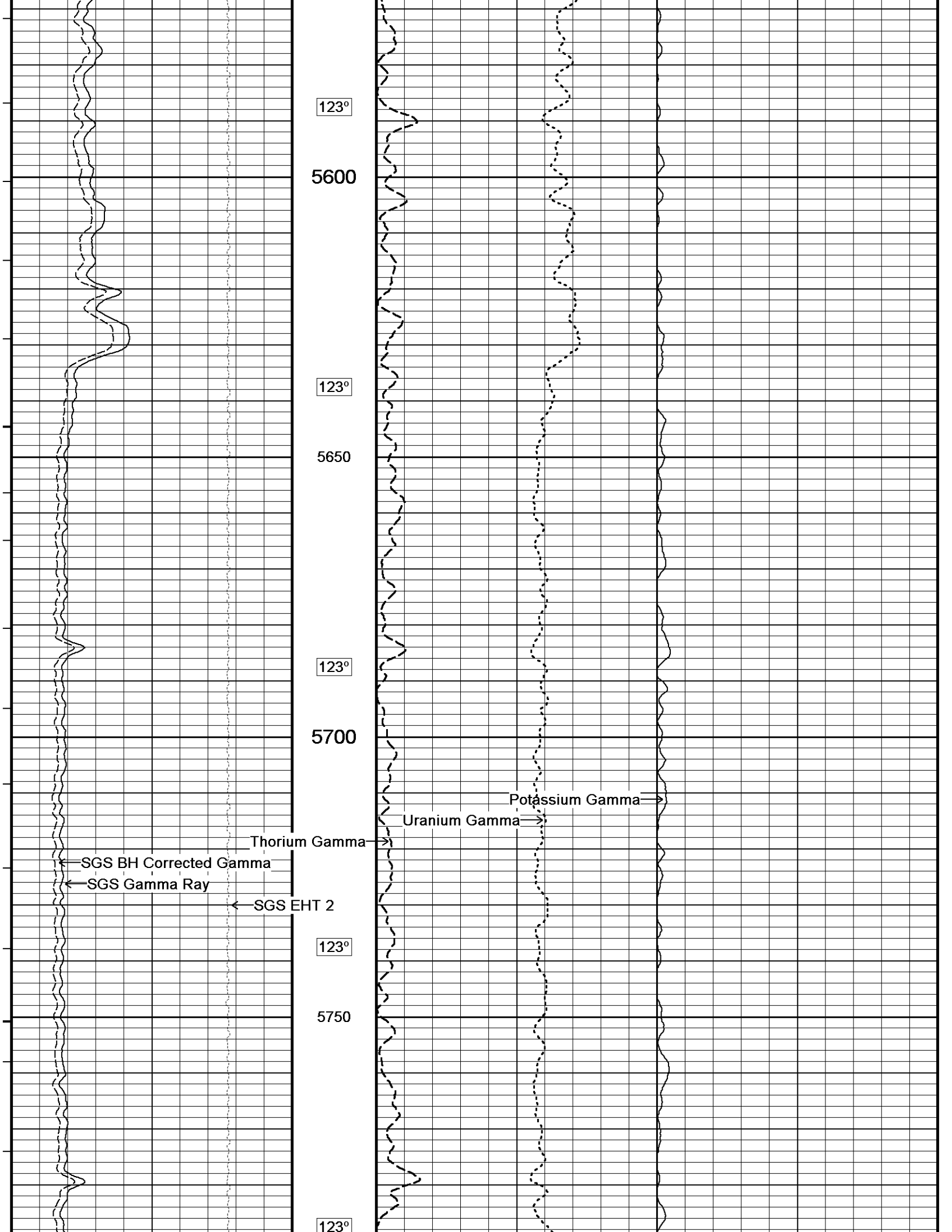




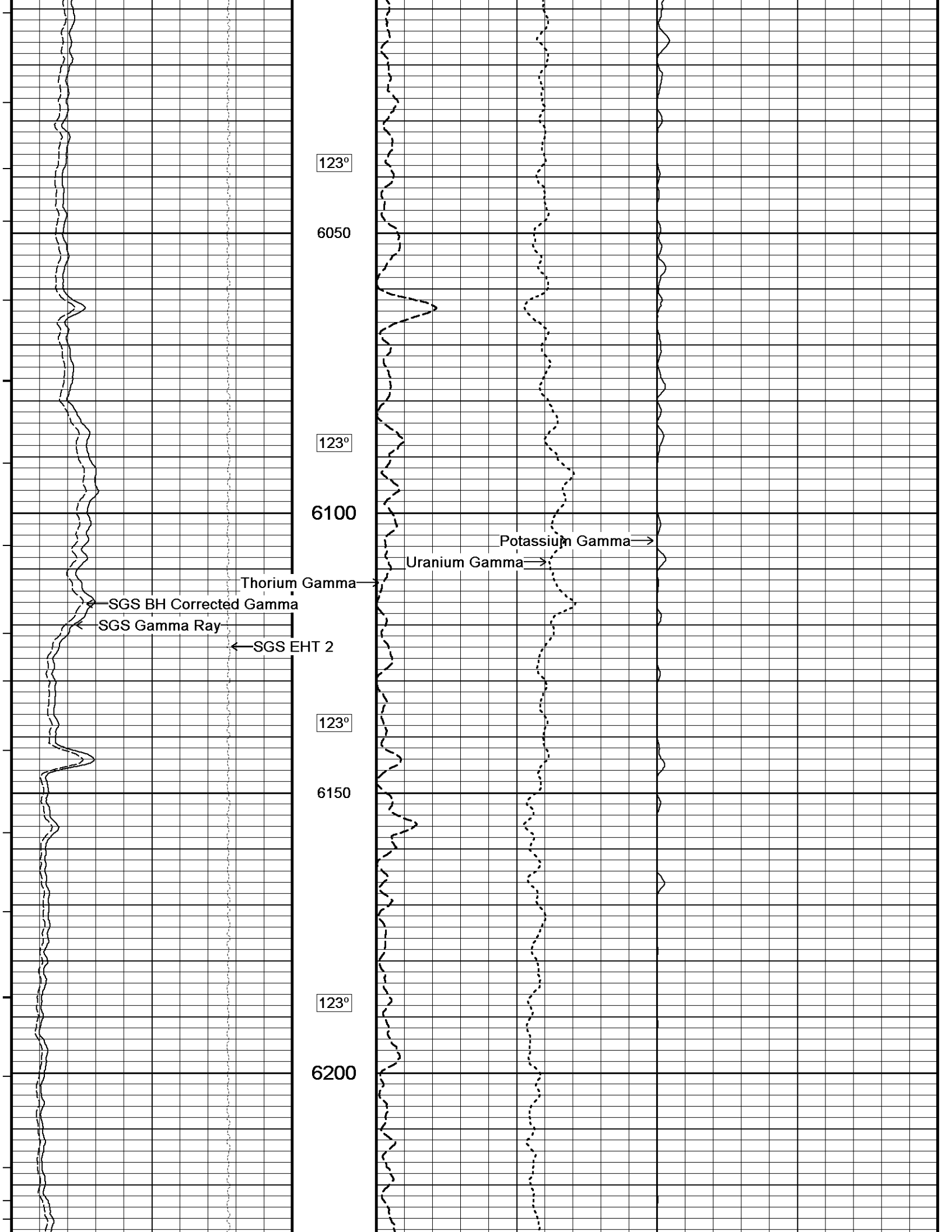


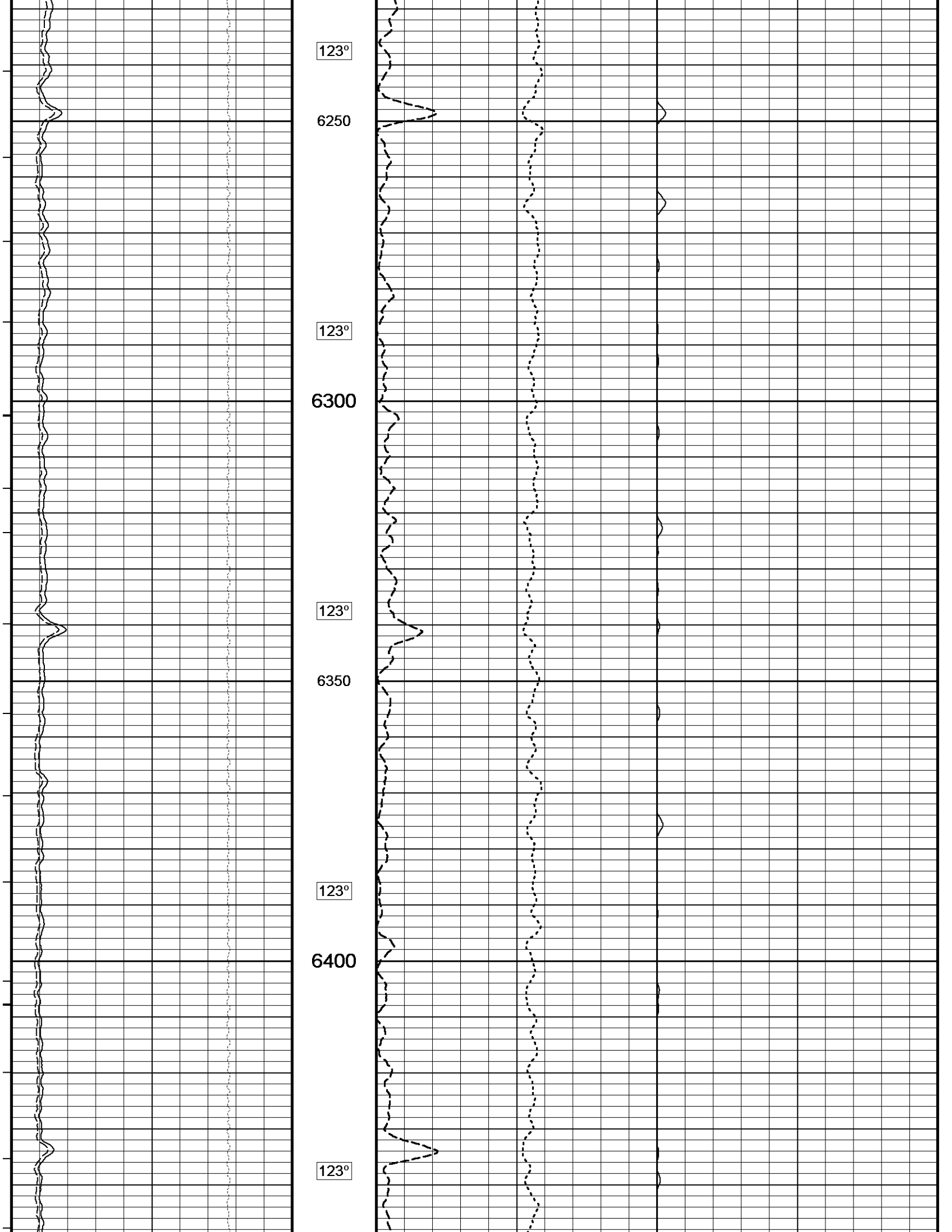


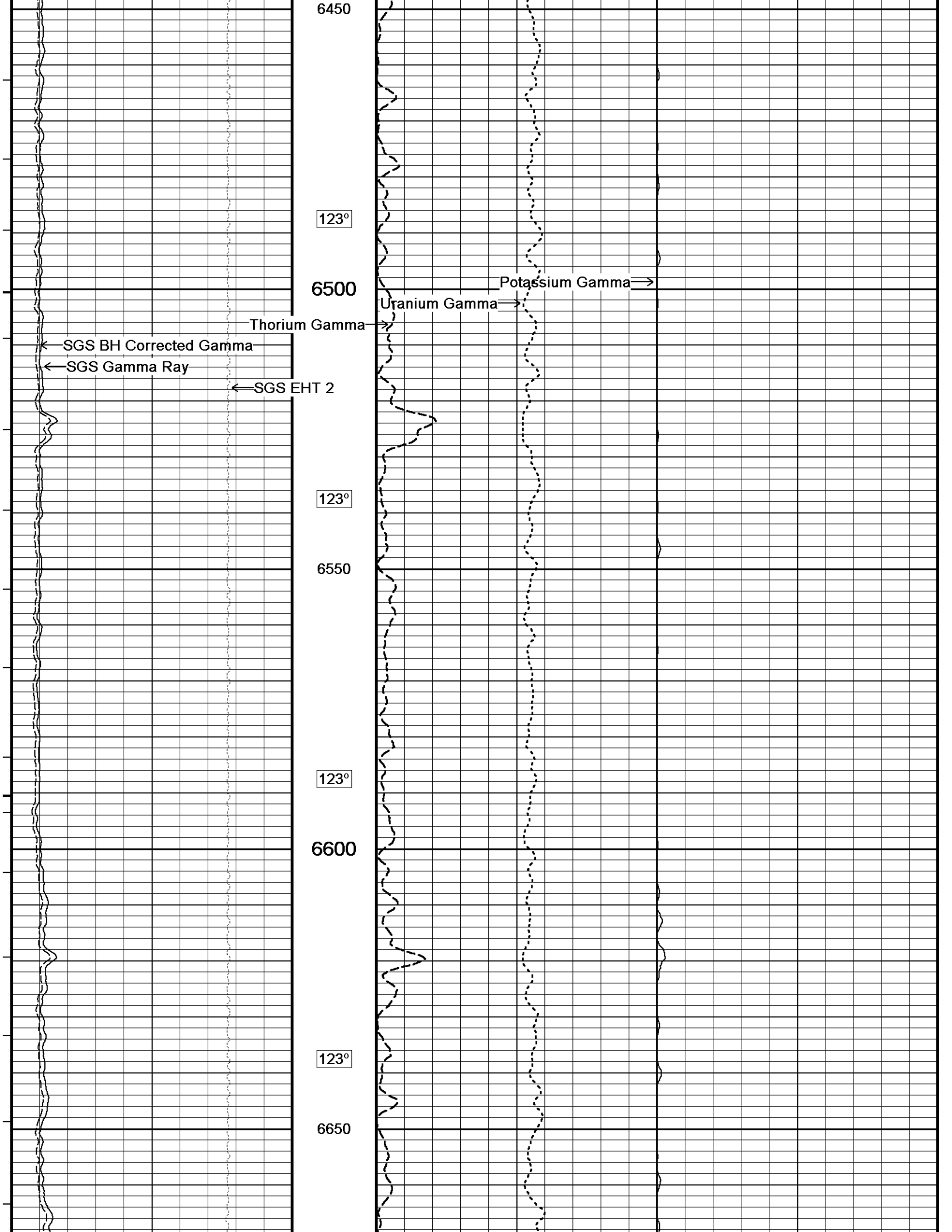


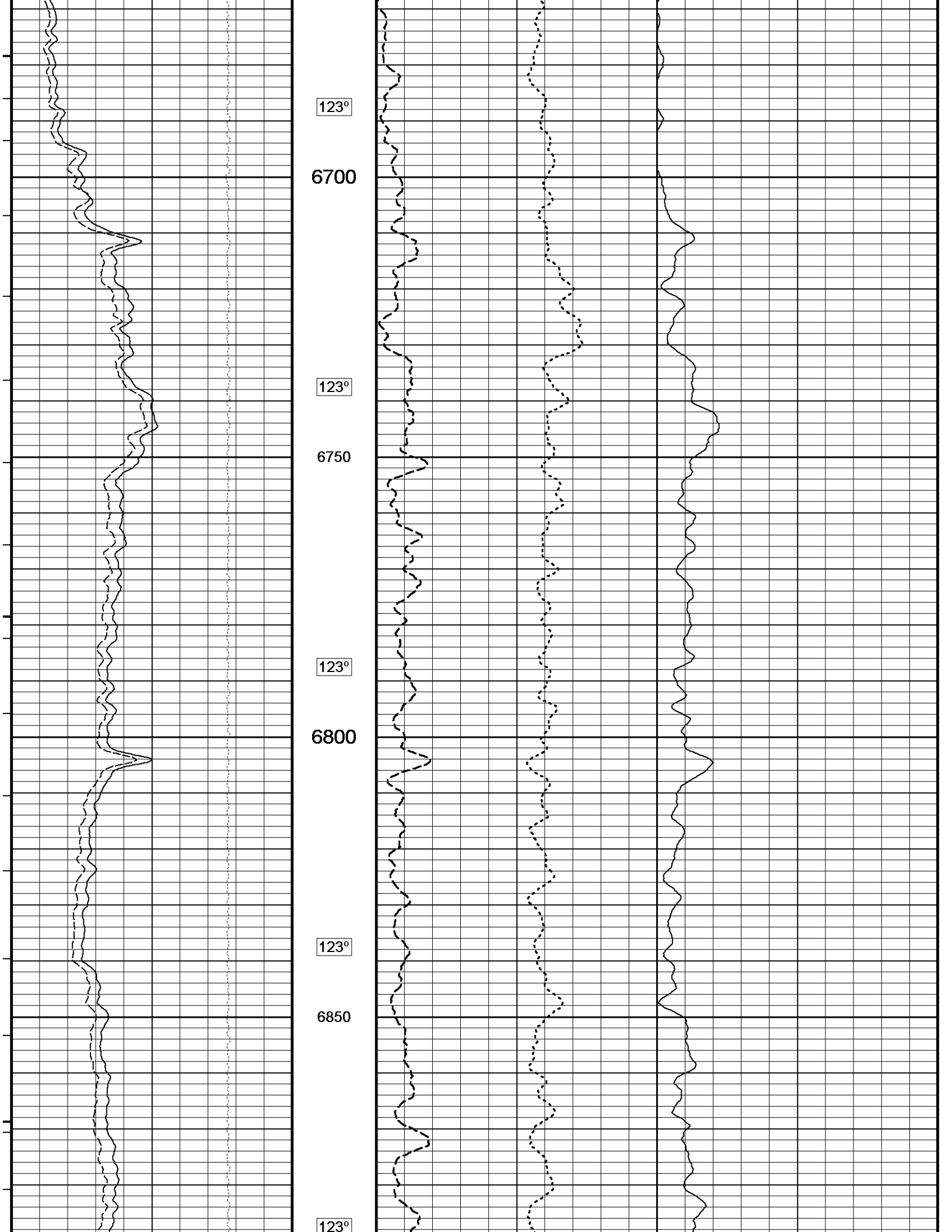


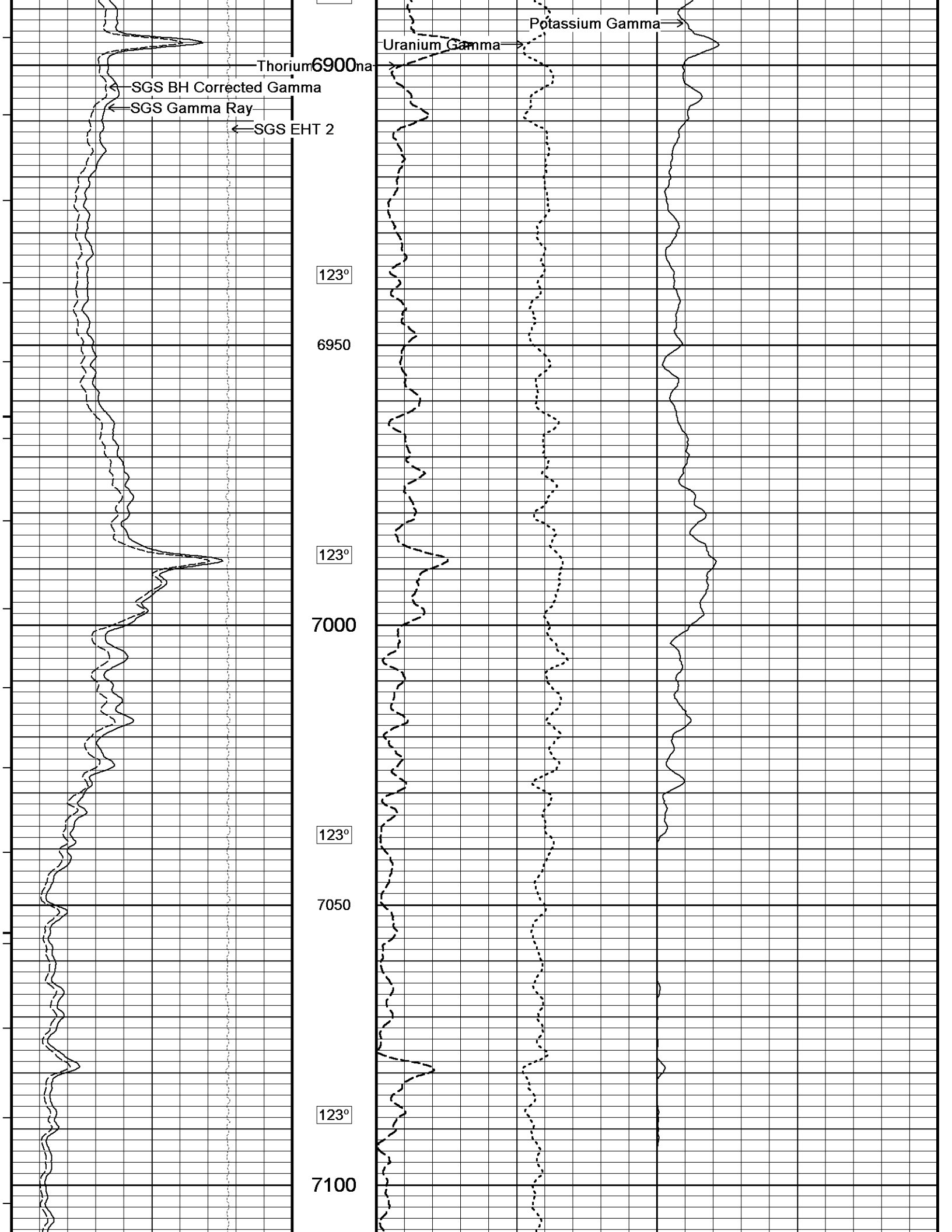


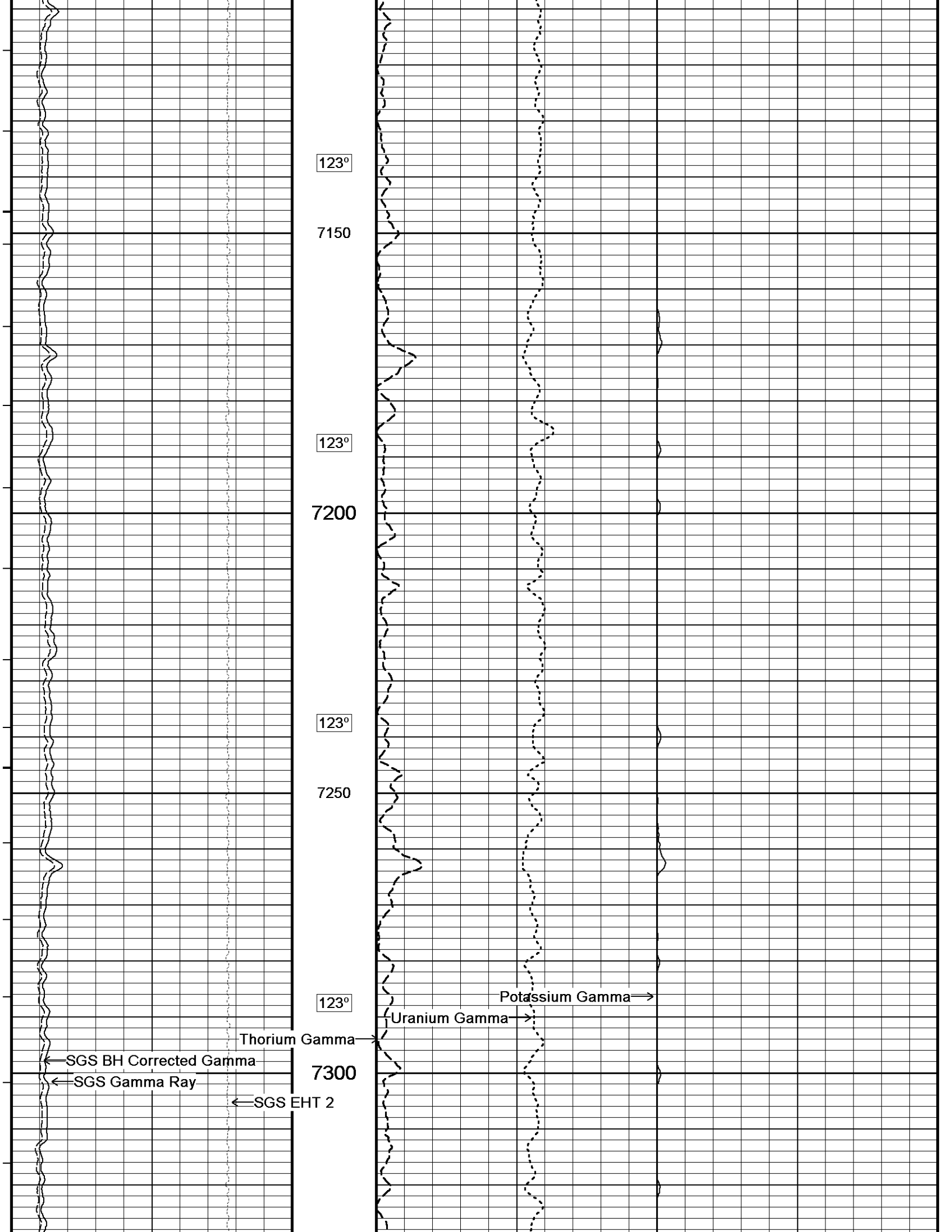












123°

7150

123°

7200

123°

7250

123°

Potassium Gamma →

Uranium Gamma →

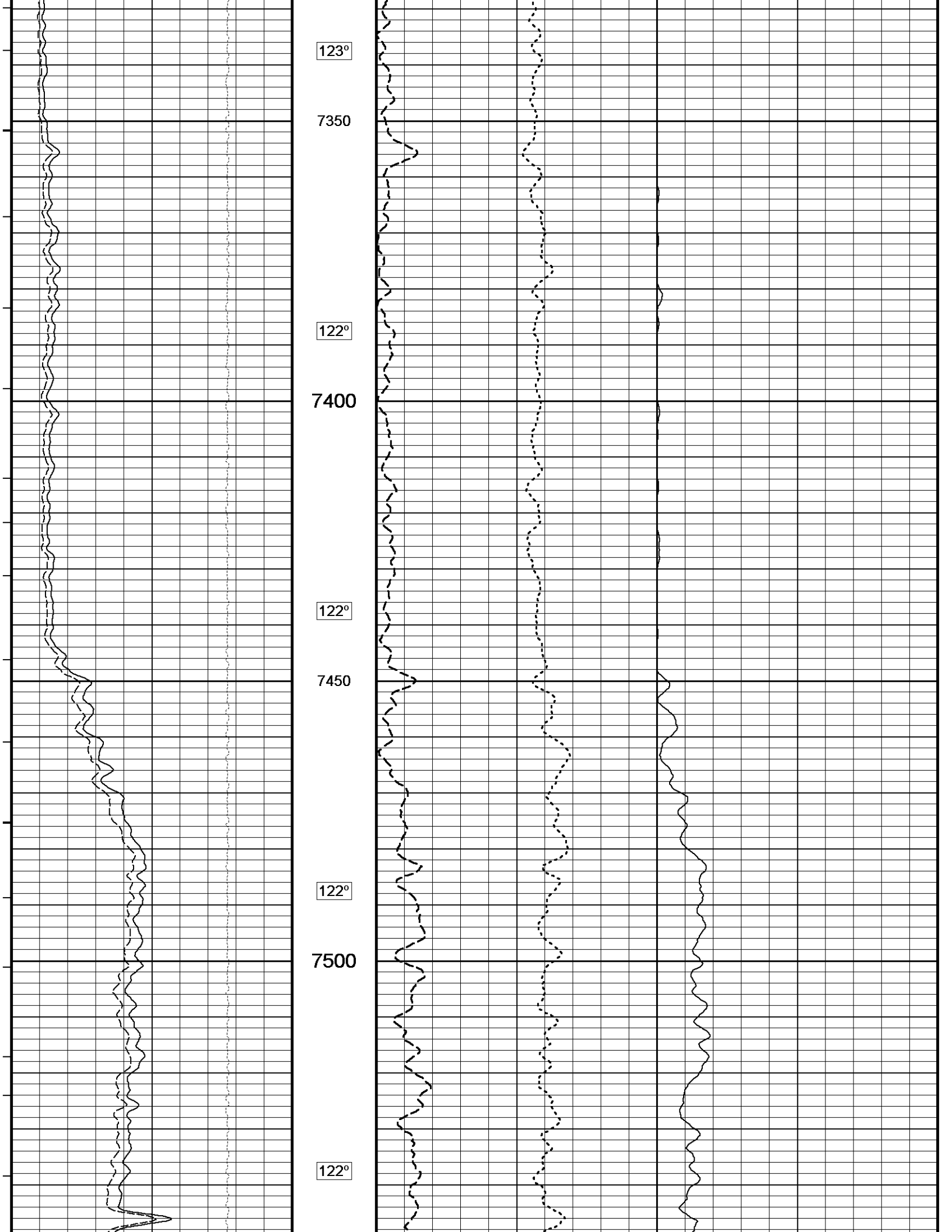
← Thorium Gamma

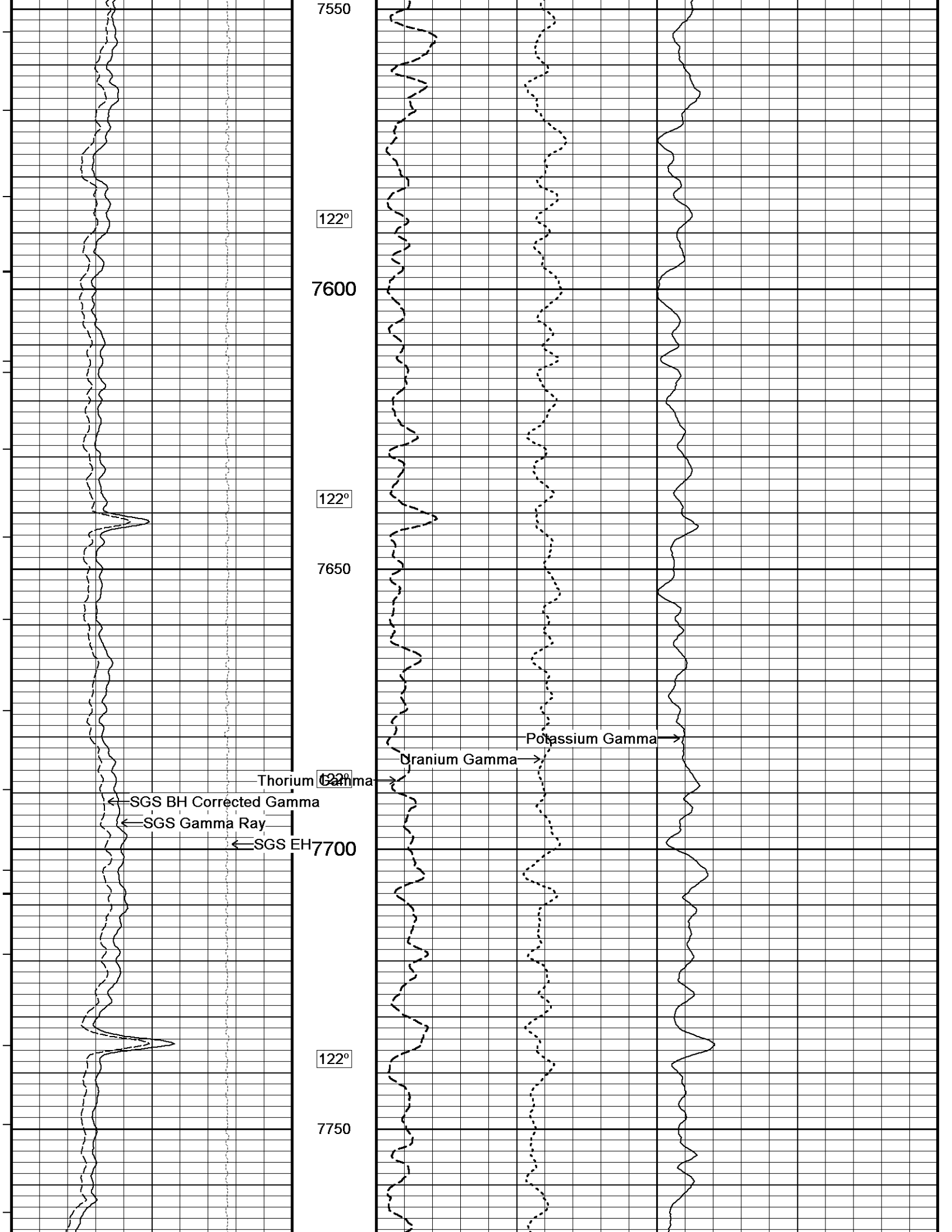
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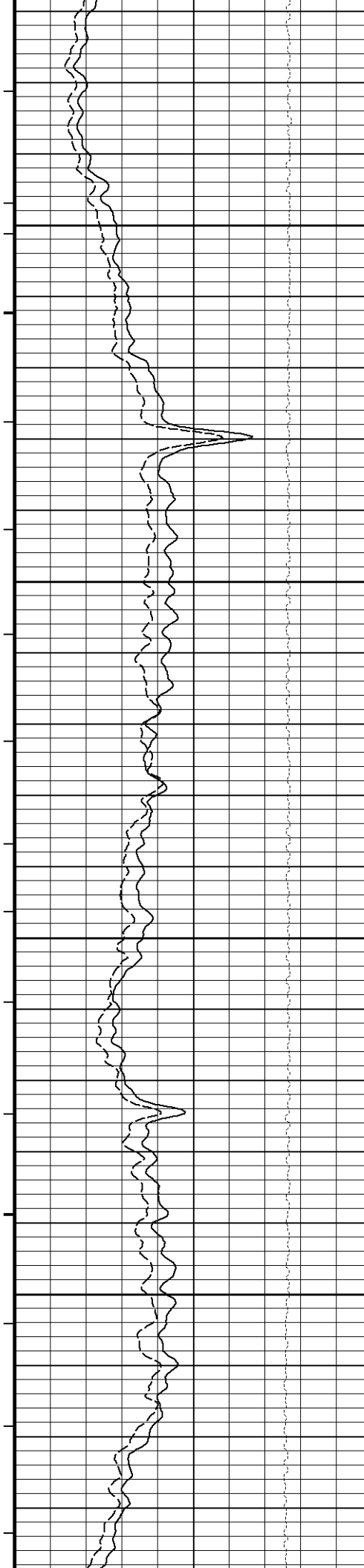
← SGS BH Corrected Gamma

← SGS Gamma Ray

← SGS EHT 2







122°

7800

121°

7850

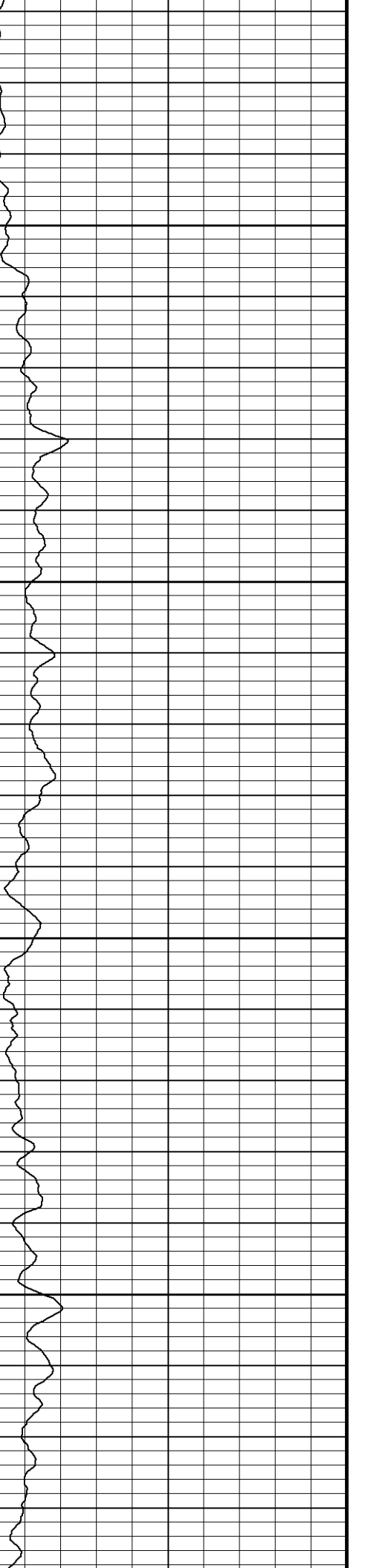
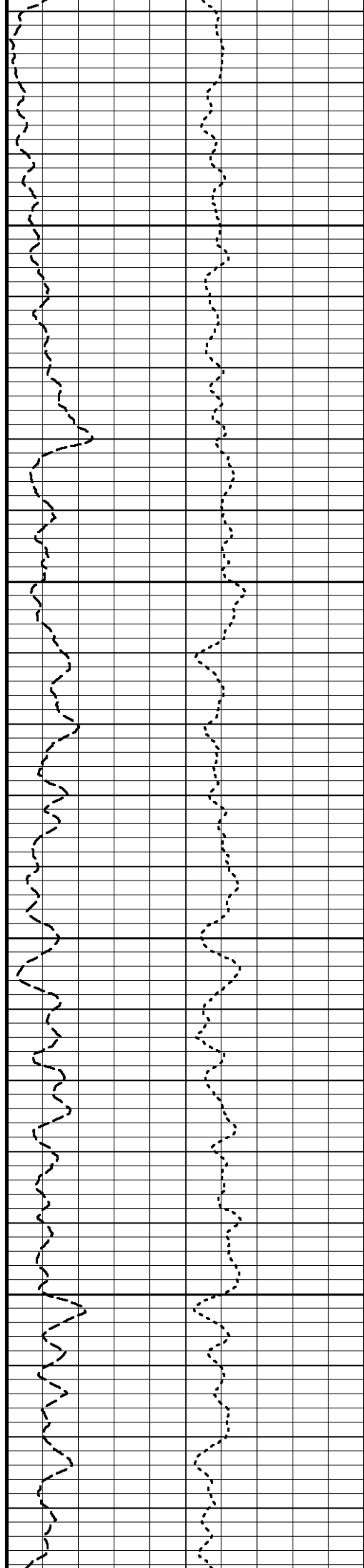
121°

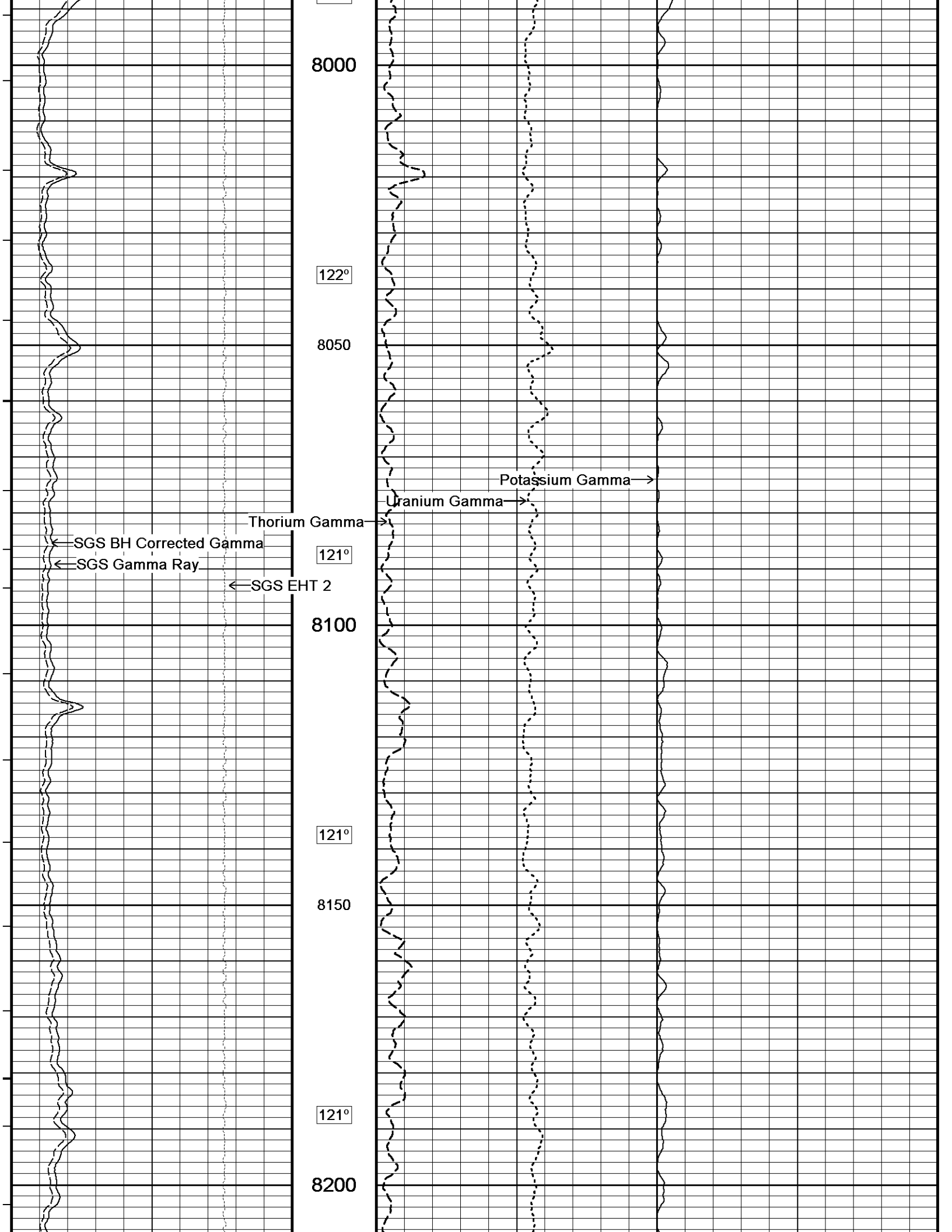
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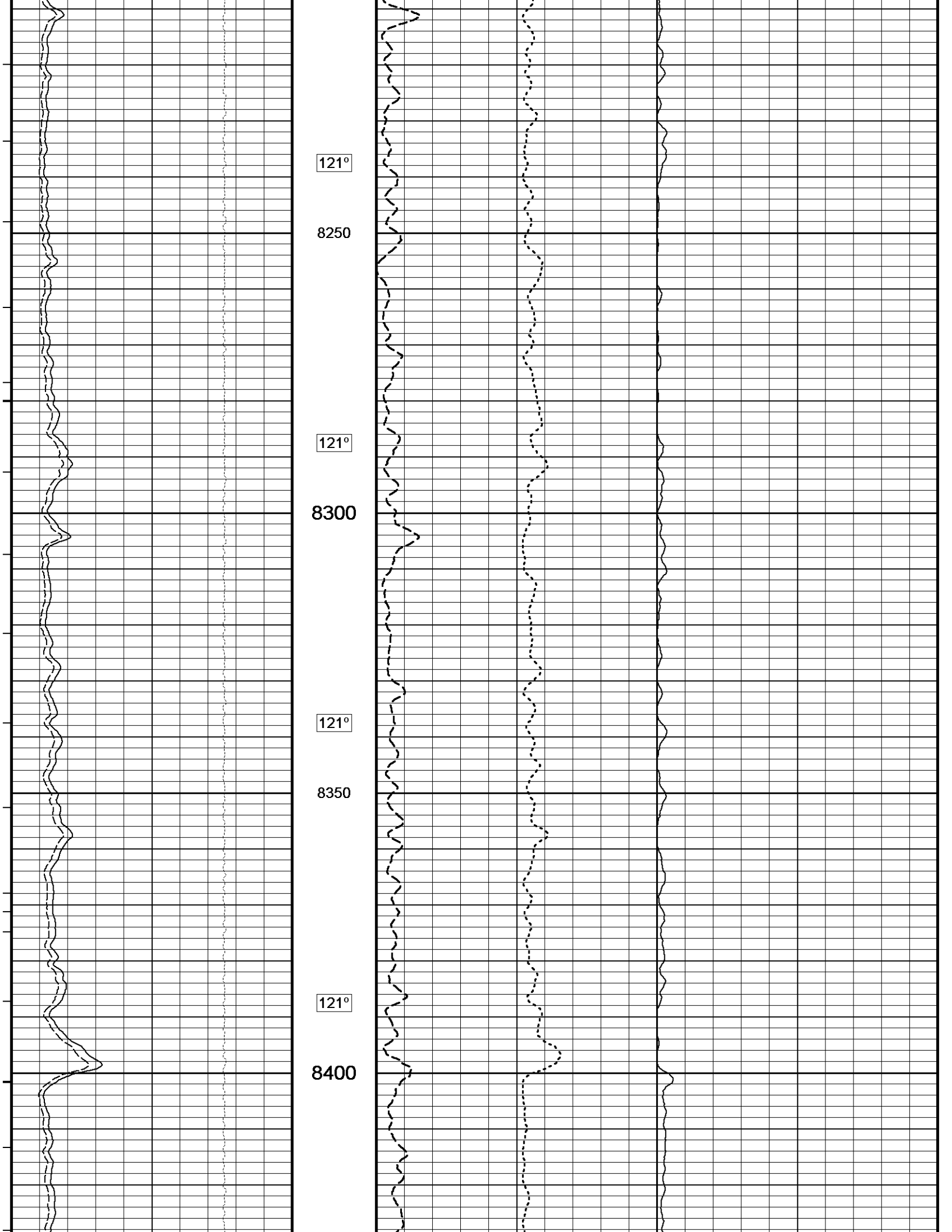
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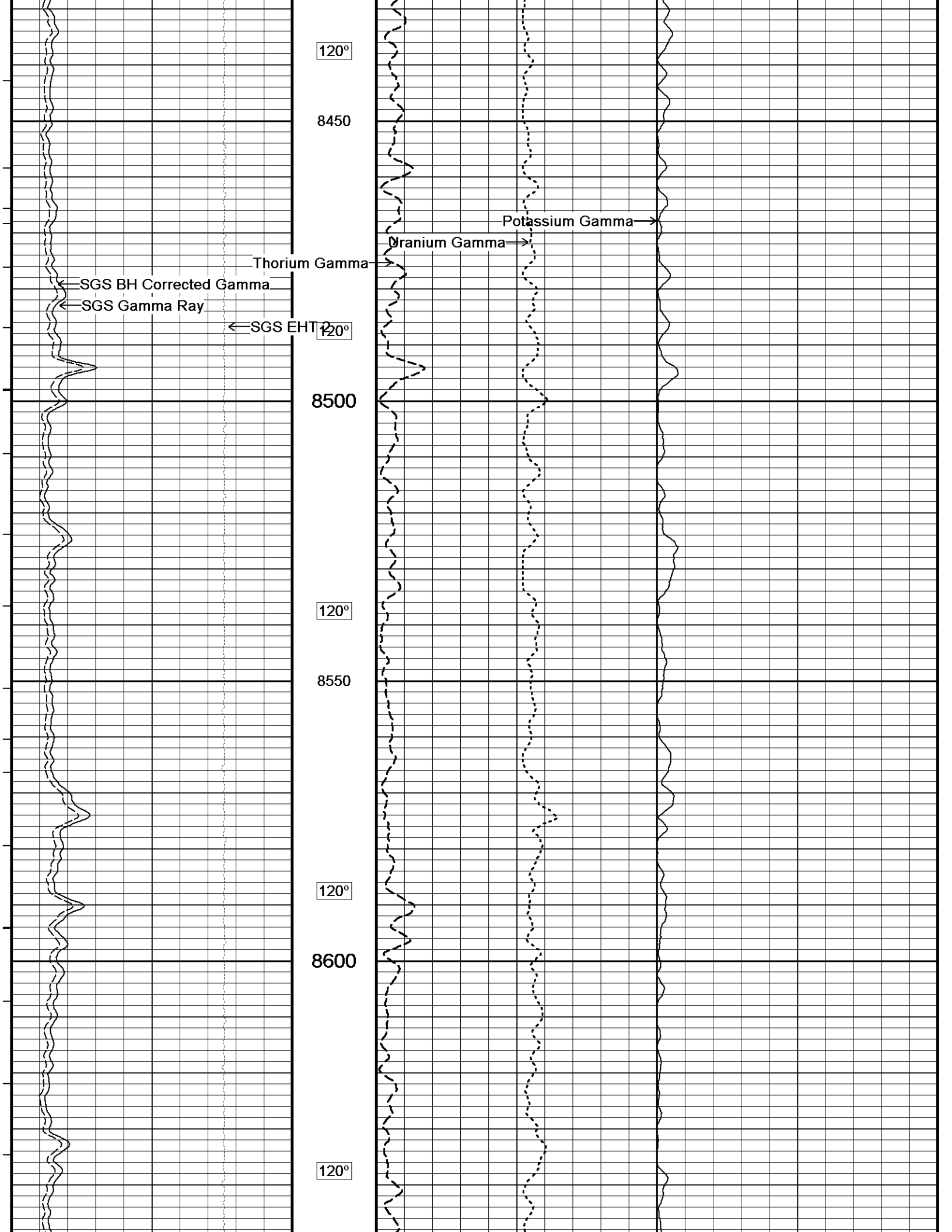
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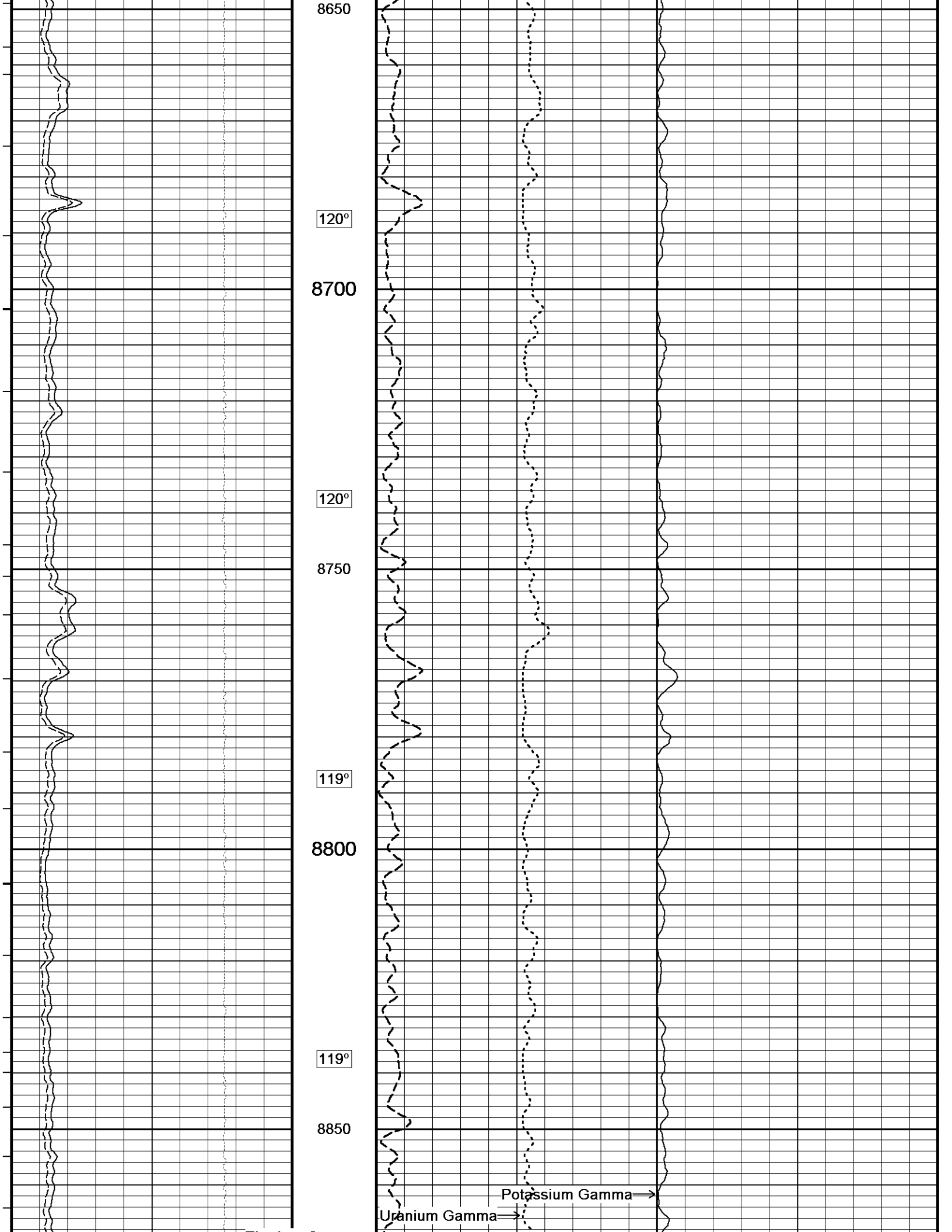
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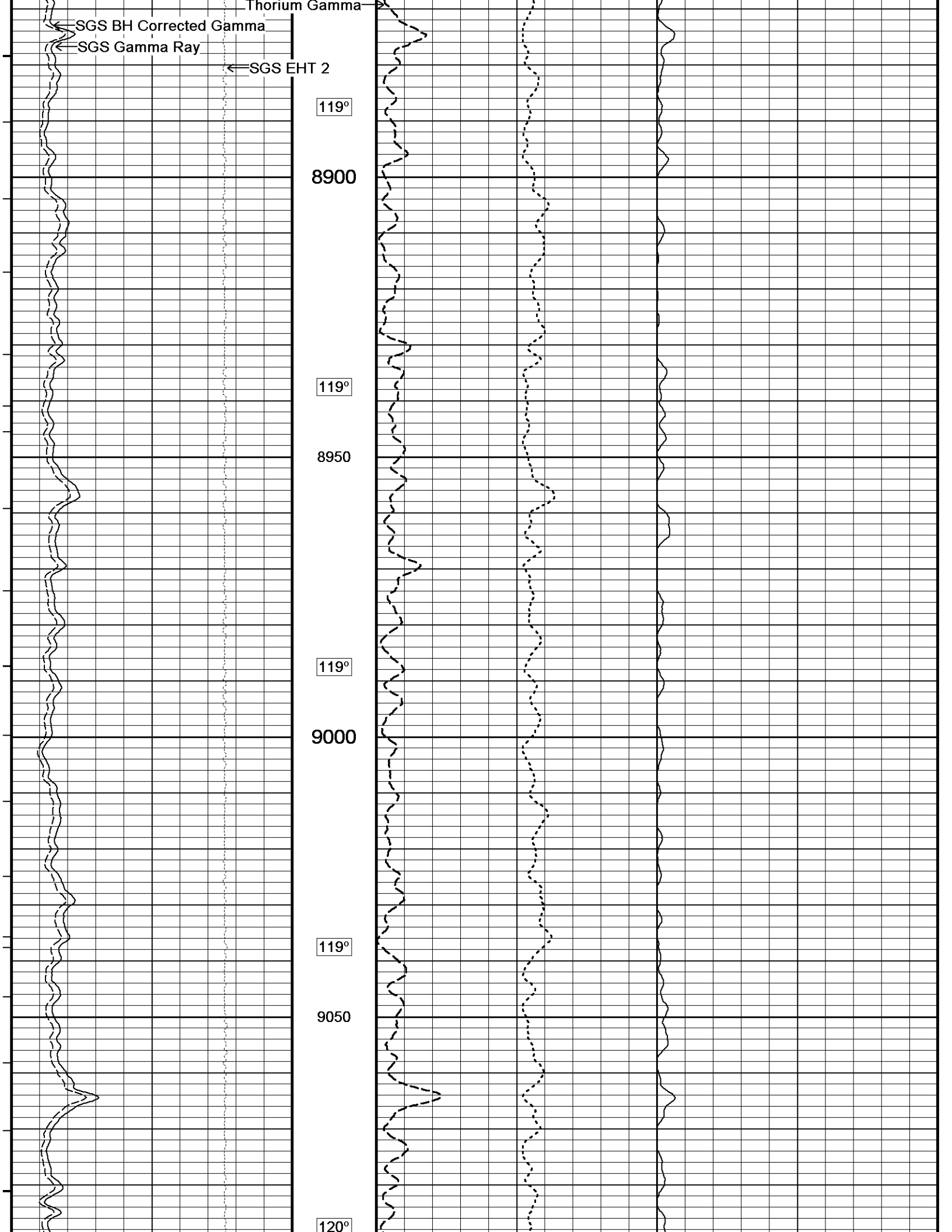












Thorium Gamma

SGS BH Corrected Gamma

SGS Gamma Ray

SGS EHT 2

119°

8900

119°

8950

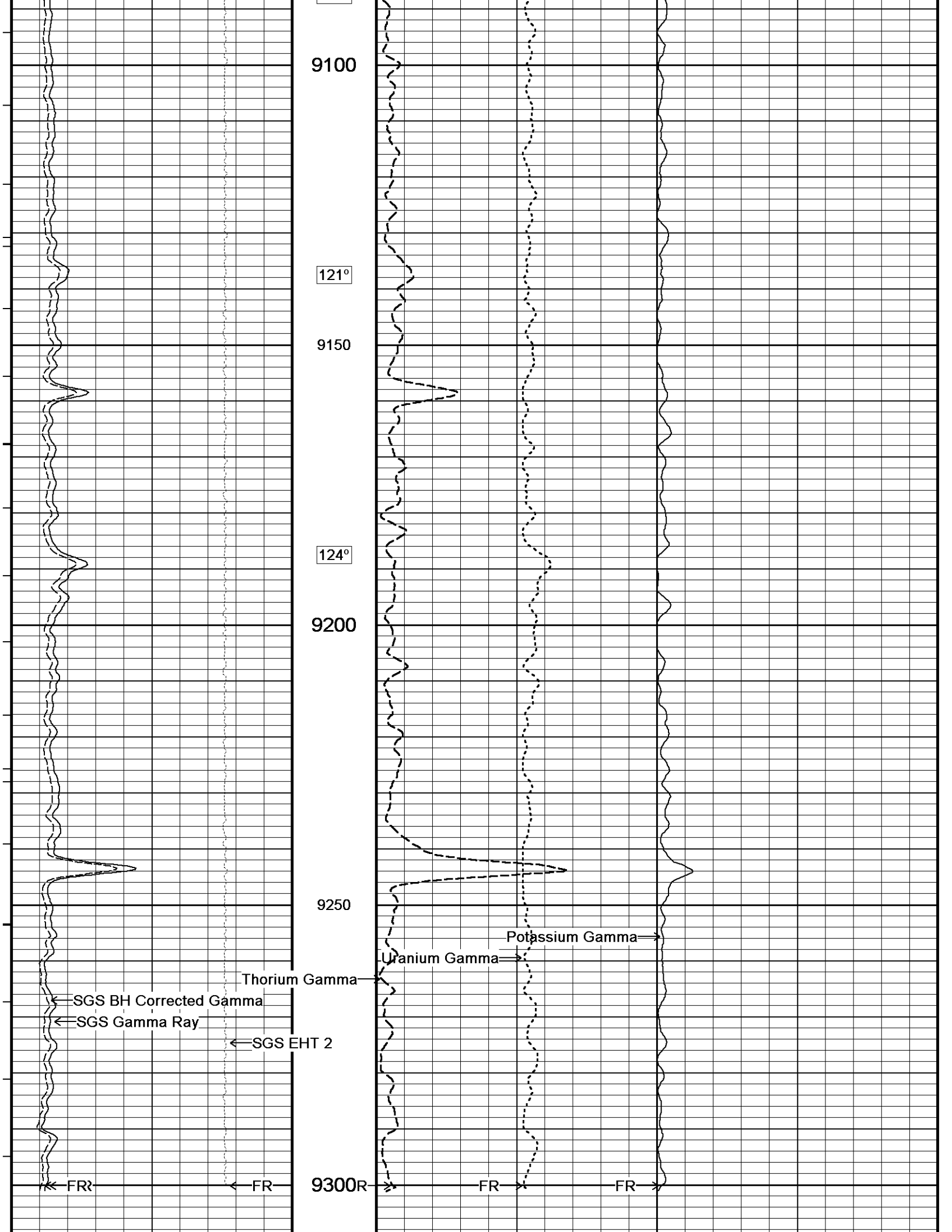
119°

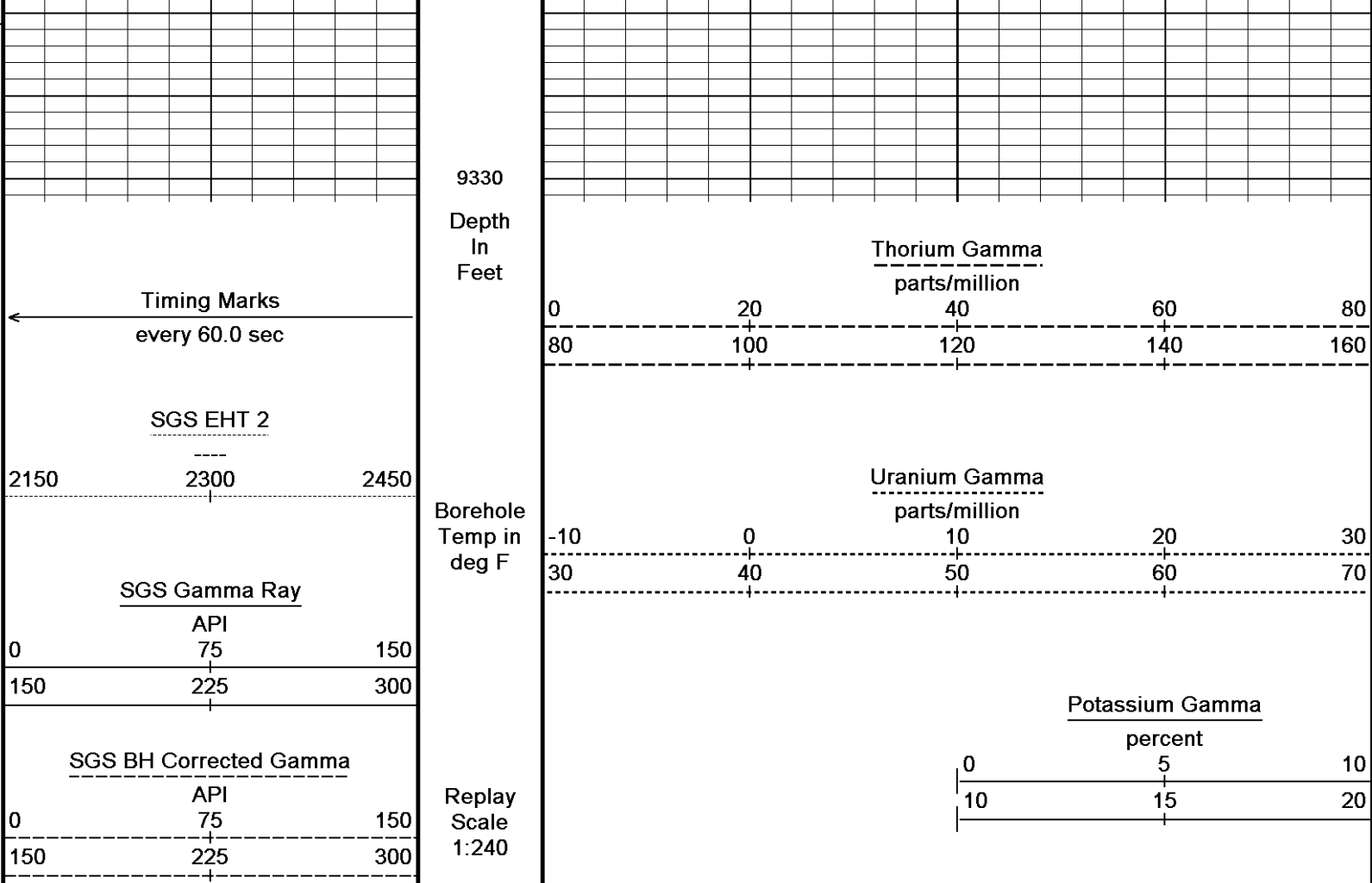
9000

119°

9050

120°





Depth Based Data - Maximum Sampling Increment 10.0cm
 Filename: C:\Minimus 13.03.7779\Data\SDRGE (UNRUH 2629 1-17H)\34701 RTAP.dta
 System Versions: Processed with 13.03.7779 Plotted with 13.03.7779
 Plotted on 10-SEP-2012 10:57
 Recorded on 10-SEP-2012 10:17

↑ DSC ↑

BEFORE SURVEY CALIBRATION
 C:\Minimus 13.03.7779\Data\SDRGE (UNRUH 2629 1-17H)\34701 RTAP.dta

Down-hole Tension Calibration All 000 Field Calibration on 24-FEB-2009 00:00

Reading No	Measured	
1	14953.75	0.00
2	17846.38	1500.00

General Constants All 000 Last Edited on 10-SEP-2012,08:59

General Parameters		
Mud Resistivity	1.500	ohm-metres
Mud Resistivity Temperature	80.000	degrees F
Water Level	0.000	feet
Density/Neutron 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	4.500	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Limestone Density Por.	
Resistivity used	Array Ind. One Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	

Down-hole Tension Calibration SMS 0

Field Calibration on 29-MAR-2011 00:00

Reading No	Measured	
1	15152.07	0.00
2	19175.97	2000.00

Strain Gauge Constants MMS-E.B 167

Last Edited on 03-AUG-2012 11:54

Atmospheric Pressure	14.70	psi
Serial Number	0	
Calibration Date	000000000000	
Base Check Date		
Dead Weight Serial Number	0	
Dead Weight Gravitational Correction	1.0	
Temperature	75.0	150.0
		250.0
		350.0
		degrees F
Pressure psia	Inc.	Dec.
	Inc.	Dec.
0.0	0.000	0.000
2000.0	0.000	0.000
4000.0	0.000	0.000
6000.0	0.000	0.000
8000.0	0.000	0.000
10000.0	0.000	0.000

Gamma Calibration MGS-C.J 135

Field Calibration on 03-SEP-2012 09:00

	Measured	Calibrated (API)
Background	85	56
Calibrator (Gross)	1453	953
Calibrator (Net)	1368	897

Gamma Constants MGS-C.J 135

Last Edited on 10-SEP-2012,08:54

Gamma Calibrator Number	
Mud Density	1.08 gm/cc
Caliper Source for Processing	Density Caliper
Tool Position	Eccentred
Concentration of KCl	0.00 kppm

High Resolution Temperature Constants MGS-C.J 135

Last Edited on

Pre-filter Length	11
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Neutron Calibration MDN-B.J 390

Base Calibration on 10-AUG-2012 02:10

Field Check on 16-AUG-2012,11:36

Base Calibration				
	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	2974	91	3714	110
Ratio	32.653		33.764	
Field Calibrator at Base			Calibrated (cps)	
			1236	1843
Ratio	0.671			
Field Check			Calibrated (cps)	
			1290	1898
Ratio	0.680			

Neutron Constants MDN-B.J 390

Last Edited on 10-SEP-2012,08:54

Neutron Source Id	P31112B
Neutron Jig Number	5917NC
Epithermal Neutron	No
Caliper Source for Processing	Density Caliper
Stand-off	0.00 inches
Mud Density	1.08 gm/cc
Limestone Sigma	7.10 cu
Sandstone Sigma	4.26 cu
Dolomite Sigma	4.70 cu
Formation Pressure Source	None
Formation Pressure	N/A kpsi
Temperature Source	Constant Value

Temperature	20.00	degrees F
Mud Salinity	1.00	kppm
Salinity Correction	Applied	
Formation Fluid Salinity Source	None	
Formation Fluid Salinity	N/A	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-B.J 329 Base Calibration on 31-AUG-2012 13:33
Field Check on 31-AUG-2012 14:02

Base Calibration		
	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	961.8	126.8
Base Check		281.9
Field Check		282.0

FE Constants MFE-B.J 329 Last Edited on 07-SEP-2012,03:21

Running Mode	No Sleeve	
MFE K Factor	0.1268	
Caliper Source for FE correction	Density Caliper	
Caliper Value for FE correction	N/A	inches
Rm Source for FE correction	Temperature Corr	
Temp. for Rm Corr.	MGS External Temperature	
Stand-off	0.5	inches

High Resolution Temperature Calibration MAI-B.J 389 Field Calibration on 19-OCT-2011 09:44

	Measured	Calibrated(Deg F)
Lower	10.00	50.00
Upper	100.00	212.00

High Resolution Temperature Constants MAI-B.J 389 Last Edited on

Pre-filter Length 11

Induction Calibration MAI-B.J 389 Base Calibration on 01-SEP-2012,07:44
Field Check on 05-SEP-2012 07:29

Base Calibration					
Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High	
1	16.7	465.5	9.3	966.2	
2	6.4	384.0	7.6	821.4	
3	3.1	258.9	5.2	566.0	
4	1.8	133.7	2.6	279.2	
Array Temperature		78.1	Deg F		
Channel		Base Check (mmho/m)		Field Check (mmho/m)	
		Low	High	Low	High
1				14.5	3894.6
2				29.5	3506.1
3				29.4	3047.2
4				19.7	2061.7
Deep				19.1	2011.6
Medium				42.3	4001.0
Shallow				42.3	5148.2
Array Temperature				80.7	Deg F

Induction Constants MAI-B.J 389 Last Edited on 10-SEP-2012,08:58

Induction Model	RtAP-WBM	
Caliper for Borehole Corr.	Density Caliper	
Hole Size for Borehole Correction	N/A	inches
Tool Centred	No	
Stand-off Type	Fins	
Stand-off	0.50	inches
Number of Fins on Stand-off	6.0000	
Stand-off Fin Angle	60.00	degrees
Stand-off Fin Width	0.5000	inches

Borehole Corr. Rm Source		Temperature Corr	
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

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	

Caliper Calibration MPD-C.J 393

Base Calibration on 31-AUG-2012 15:06
Field Calibration on 31-AUG-2012 15:06

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	17903	4.01
2	26102	5.96
3	34623	7.98
4	42800	9.86
5	51872	11.88
6	N/A	N/A

Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.97	5.96

Photo Density Calibration MPD-C.J 393

Base Calibration on 31-AUG-2012 17:21
Field Check on 05-SEP-2012 07:33

Density Calibration					
Base Calibration		Measured		Calibrated (sdu)	
	Near	Far	Near	Far	
Reference 1	58443	27289	59869	31110	
Reference 2	24170	2616	24557	2522	

Field Check at Base		
	1220.9	1338.4

Field Check		
	1222.0	1343.8

PE Calibration					
Base Calibration		Measured		Calibrated	
	WS	WH	Ratio	Ratio	
Background	227	1101			
Reference 1	25332	58248	0.439	0.369	
Reference 2	7158	24033	0.302	0.271	

Field Check at Base		
	227.1	1101.3

Field Check		
	223.5	1100.6

Density Source Id	p31112b	
Nylon Calibrator Number	633	
Aluminium Calibrator Number	633	
Density Shoe Profile	4 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.08	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	

Matrix Density (gm/cc)	Depth (ft)
2.71	
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	0.00
0.00	0.00

Spectral Gamma Calibration SGS-E.J 170

Base Calibration on 26-MAR-2012 22:31
Field Calibration on 26-MAR-2012 22:03

Base Calibration

Potassium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	80.0	23.7	2.4	1.0	1.3
Calibrator (Gross)	205.8	107.5	23.2	0.9	1.4
Calibrator (Net)	125.8	83.7	20.8	-0.1	0.1

Concentrations	K %	U ppm	Th ppm
	5.8	0.0	0.0

Uranium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	80.0	23.7	2.4	1.0	1.3
Calibrator (Gross)	480.0	163.5	14.5	7.8	4.1
Calibrator (Net)	400.0	139.8	12.1	6.8	2.8

Concentrations	K %	U ppm	Th ppm
	0.0	14.8	0.0

Thorium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	80.0	23.7	2.4	1.0	1.3
Calibrator (Gross)	394.8	138.7	11.4	6.2	14.7
Calibrator (Net)	314.7	115.0	9.1	5.2	13.5

Concentrations	K %	U ppm	Th ppm
	0.0	0.0	44.3

Mixture Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	80.0	23.7	2.4	1.0	1.3
Calibrator (Gross)	918.4	363.2	44.9	13.6	18.2
Calibrator (Net)	838.4	339.5	42.5	12.6	16.9

Field Calibration

Gamma Ray

	Measured	Calibrated (API)
Background	113	23
Calibrator (Gross)	1362	273
Calibrator (Net)	1250	250

Mixture Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
--	--------	--------	--------	--------	--------

Background	80.0	23.7	2.4	1.0	1.3
Calibrator (Gross)	918.4	363.2	44.9	13.6	18.2
Calibrator (Net)	838.4	339.5	42.5	12.6	16.9

Spectral Gamma Constants SGS-E.J 170

Last Edited on 10-SEP-2012,08:55

Background Calibrator Number	0	
Mixture Calibrator Number	147-1	
Potassium Calibrator Number	148-1	
Uranium Calibrator Number	150-1	
Thorium Calibrator Number	149-1	
Mud Density	1.08	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

DOWNHOLE EQUIPMENT

C:\Minimus 13.03.7779\Data\SDRGE (UNRUH 2629 1-17H)\34701 RTAP.dta

- Compact Linker (Shuttle Running Tool 3.5
MLK-A 1 LG: 4.87 ft WT: 30.9 lb OD: 2.52 in
- Compact Linker (MBS-D.A 400v Compact Bat
MLK-A 2 LG: 14.24 ft WT: 30.9 lb OD: 2.24 in
- Compact Linker (MBS-D.A 400v Compact Bat
MLK-A 3 LG: 14.24 ft WT: 30.9 lb OD: 2.24 in
- MBS-G.A 200v Compact Battery Sub
MBS-G.A 135 LG: 16.66 ft WT: 132.3 lb OD: 2.24 in
- Compact Memory Sub E.B
MMS-E.B 167 LG: 5.20 ft WT: 37.5 lb OD: 2.24 in
- Compact Tool Isolator sub.
MTI-B.A 67 LG: 1.54 ft WT: 13.2 lb OD: 2.24 in
- Compact Short Gamma
MGS-C.J 135 LG: 3.41 ft WT: 24.3 lb OD: 2.24 in
- Compact Collar Locator
MCL-B.J 60 LG: 3.17 ft WT: 26.5 lb OD: 2.24 in
- SKJ-E.A Compact Knuckle Joint
SKJ-E.A 166 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in
- SHA-H Compact Swivel Head Adaptor
SHA-H 167 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in
- MIS-D.B Compact Inline Bowspring sub
MIS-D.B 596 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in
- Compact Neutron
MDN-B.J 390 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in
- Compact Density/Caliper
MPD-C.J 393 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in
- MIS-D.B Compact Inline Bowspring sub
MIS-D.B 603 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in
- SHA-F Compact Swivel Head Adaptor
SHA-F 33 LG: 2.74 ft WT: 26.5 lb OD: 2.24 in



- 86.35 ft GGME - Borehole Corr. MGS Gamma
- 84.36 ft GSXT - MGS External Temperature
- 82.34 ft GCSL - MCL C. Collar Locator
- 67.46 ft NFRL - Limestone Neutron Por.
- 60.24 ft AVOL - Annular Volume
- 60.24 ft HVOL - Hole Volume
- 60.24 ft CLDC - Density Caliper
- 58.31 ft NFRL - Limestone Density Por.
- 58.31 ft DEN - Compensated Density
- 58.31 ft DCOR - Density Correction
- 58.24 ft PDPE - PE

SKJ-E.B Compact Knuckle Joint
 SKJ-E.B 472 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MIS-E.B Compact Inline Standoff sub
 MIS-E.B 577 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Focussed Electric
 MFE-B.J 329 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

MIS-E.B Compact Inline Standoff sub
 MIS-E.B 576 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

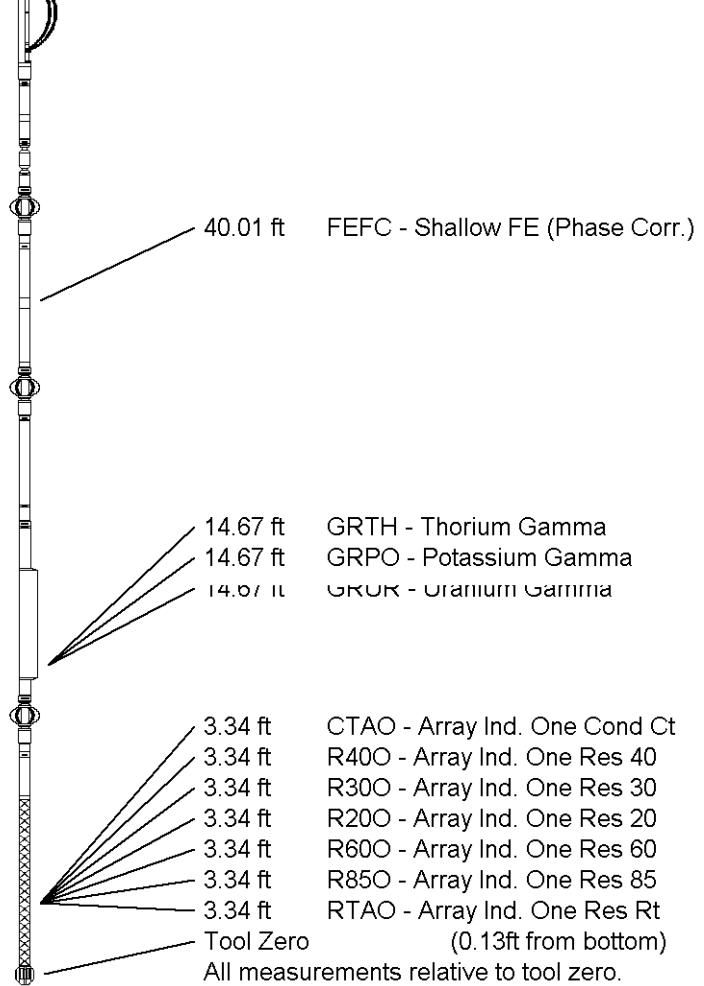
Compact Linker (MBS-D.A 400v Compact Bat
 MLK-A 4 LG: 14.24 ft WT: 30.9 lb OD: 2.24 in

Spectral Gamma Ray Sub
 SGS-E.J 170 LG: 7.78 ft WT: 105.8 lb OD: 3.54 in

MIS-E.B Compact Inline Standoff sub
 MIS-E.B 573 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Induction
 MAI-B.J 389 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 144.02 ft Weight: 910.5 lb



COMPANY	SANDRIDGE ENERGY
WELL	UNRUH 2629 1-17H
FIELD	MONGER
PROVINCE/COUNTY	GRAY
COUNTRY/STATE	USA / KANSAS

Elevation Kelly Bushing	2780.00	feet	First Reading	9315.00	feet
Elevation Drill Floor	2780.00	feet	Depth Driller	9320.00	feet
Elevation Ground Level	2760.00	feet	Depth Logger	9320.00	feet



Weatherford®

**CML MESSENGER SHUTTLE
 SPECTRAL GAMMA RAY
 LOG**