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299-E33-341 (C5856)
Log Data Report

Borehole Information:

Borehole:		299-E33-341 (C5856)		Site:	West of BY cribs
Coordinates (WA St Plane)		GWL[1] (ft):	235.1	GWL Date:	04/15/08
North (m)	East (m)	Drill Date	TOC Elevation	Total Depth (ft)	Type
Not available	Not available	05/08	Not available	235	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded steel	0.7	11 3/4	10 3/4	1/2	0.7	98
Threaded steel	2.35	9 5/8	8 5/8	1/2	2.35	232.5

Borehole Notes:

The logging engineer measured the casing diameters with a caliper and steel tape.

Spectral Gamma Logging System (SGLS) Log Run Information:

Logging System:	Gamma 4L		Type: Serial No.:	SGLS 60% HpGe 45TP32211A
Effective Calibration Date:	12/31/07	Calibration Reference:	HGLP-CC-027	
		Logging Procedure:	HGLP-MAN-002, Rev. 0	

Log Run	1	2 Repeat	5	6	7 Repeat
Date	05/02/08	05/02/08	05/30/08	06/02/08	06/02/08
Logging Engineer	Spatz	Spatz	Spatz	Spatz	Spatz
Start Depth (ft)	98.0	42.0	235.0	136.0	111.0
Finish Depth (ft)	0.0	32.0	135.0	96.0	97.0
Count Time (sec)	100	100	100	100	100
Live/Real	R	R	R	R	R
Shield (Y/N)	N	N	N	N	N
MSA Interval (ft)	1.0	1.0	1.0	1.0	1.0
Pre-Verification	DL311CAB	DL311CAB	DL391CAB	DL401CAB	DL401CAB
Start File	DL311000	DL311099	DL391000	DL401000	DL401041
Finish File	DL311098	DL311109	DL391100	DL401040	DL401055
Post-Verification	DL311CAA	DL311CAA	DL391CAA	DL401CAA	DL401CAA
Depth Return Error (in.)	0	0	- 3.0	N/A	- 1.5
Comments	No fine gain adjustment	No fine gain adjustment	No fine gain adjustment	No fine gain adjustment	No fine gain adjustment

Notes: **None**

Neutron Moisture Logging System (NMLS) Log Run Information:

Logging System:	Gamma 4H (with AmBe source)		Type: Serial No.:	NMLS H310700352
Effective Calibration Date:	11/06/07	Calibration Reference:	HGLP-CC-021	
		Logging Procedure:	HGLP-MAN-002, Rev. 0	

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Log Run	3	4 Repeat	8	9 Repeat	
Date	05/02/08	05/02/08	06/02/08	06/02/08	
Logging Engineer	Spatz	Spatz	Spatz	Spatz	
Start Depth (ft)	0.0	21.0	96.0	97.0	
Finish Depth (ft)	100.0	11.0	196.0	111.0	
Count Time (sec)	15	15	15	15	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	
MSA Interval (ft)	0.25	0.25	0.25	0.25	
Pre-Verification	DHD72CAB	DHD72CAB	DHE32CAB	DHE32CAB	
Start File	DHD72000	DHD72394	DHE32000	DHE32523	
Finish File	DHD72393	DHD72434	DHE32522	DHE32579	
Post-Verification	DHD72CAA	DHD72CAA	DHE32CAA	DHE32CAA	
Depth Return Error (in.)	0	0	N/A	- 4.0	
Comments	None	None	None	None	

Notes: **None**

Logging Operation Notes:

Logging was conducted with a centralizer on the sondes. All measurements are referenced to ground surface.

Analysis Notes:

Analyst:	Henwood	Date:	09/16/08/08	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre-run and post-run verifications for the logging systems were performed before and after each day's data acquisition. The acceptance criteria were met.

A casing correction for a 1/2-in.-thick casing was applied to the SGLS data. Data acquired below 235.4 ft were corrected for water.

The moisture data are reported in counts per second (cps) as there is no valid calibration available for the casings used in this borehole. The data reflect relative moisture content.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with EXCEL worksheet templates identified as G4LDec07.xls using efficiency functions and corrections for casing, dead time, and water as determined from annual calibrations.

Results and Interpretations:

Cs-137 was detected near the ground surface and between 11 and 34 ft. The maximum concentration was measured at approximately 3400 pCi/g at 16 ft.

Co-60 was detected from 31 to 52 ft, from 81 to 110 ft and at 139 and 231 ft. The maximum concentration was approximately 1 pCi/g at 41 ft.

MDLs for processed uranium (U-238 and U-235) are plotted because some investigators believe the 216-BY cribs may be a source of uranium contamination in the groundwater in the area. A few detections of uranium were identified using the routine processing software. However, further inspection of the individual spectra showed no full energy peaks. Therefore, no uranium was detected in the vadose zone.

Moisture data indicate relatively high moisture at a few depth locations, which may indicate thin intervals of fine grained sediment.

Repeat sections acquired for each logging system indicate good repeatability.

List of Log Plots:

Depth Reference is ground surface

Manmade Radionuclides (2 pages)
Natural Gamma Logs (2 pages)
Combination Plot (3 pages)
Combination Plot (0 to 240 ft)
Total Gamma & Moisture (0 to 240 ft)
Repeat of Manmade Radionuclides (32 to 42 ft)
Repeat of Manmade Radionuclides (97 to 111 ft)
Repeat Section of Natural Gamma Logs (32 to 42 ft)
Repeat Section of Natural Gamma Logs (97 to 111 ft)
Repeat Section for Moisture (11 to 21 and 97 to 111 ft)

[1] GWL – groundwater level

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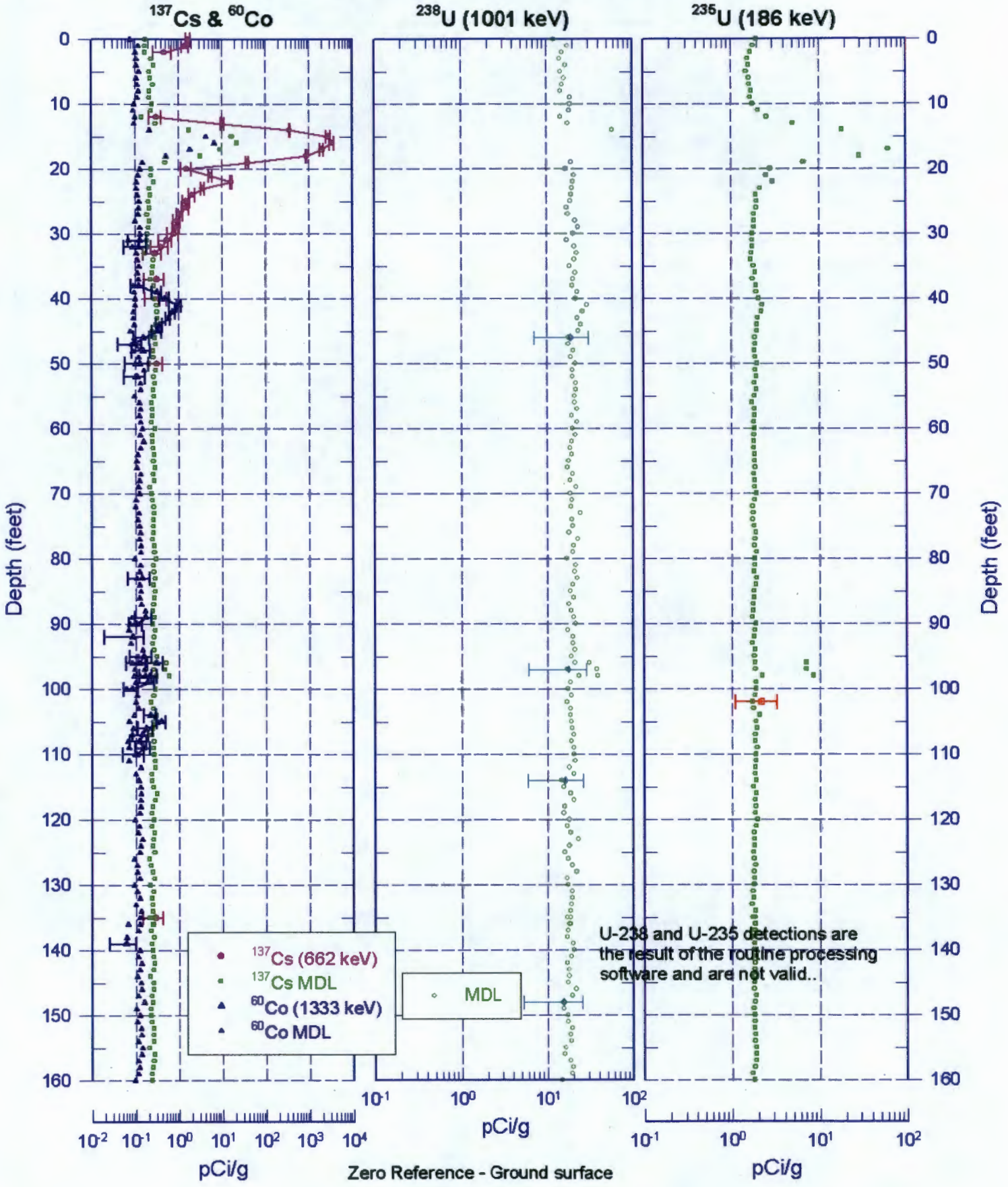
299-E33-341 (C5856)
Man-Made Radionuclides



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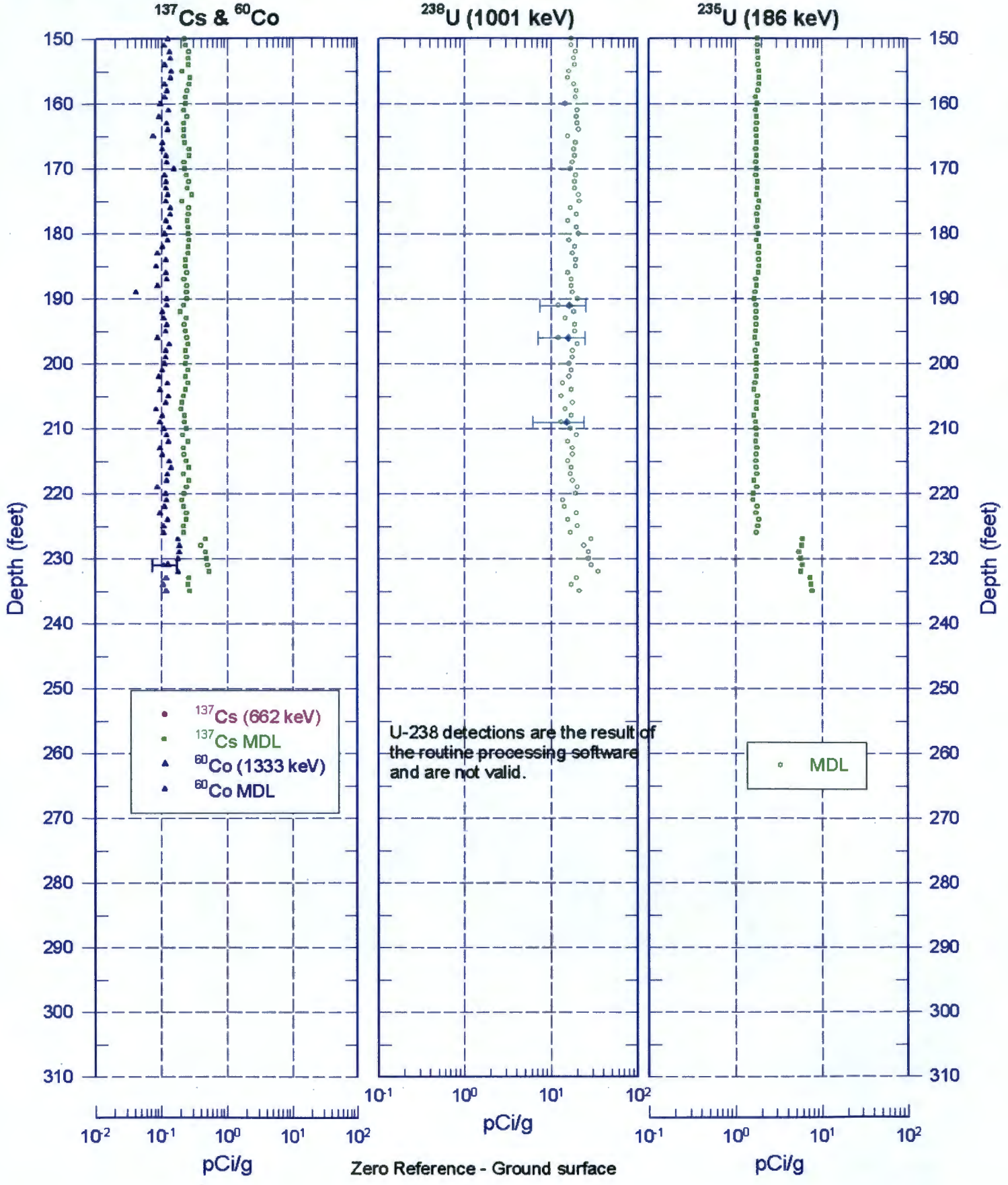
299-E33-341 (C5856)
Man-Made Radionuclides



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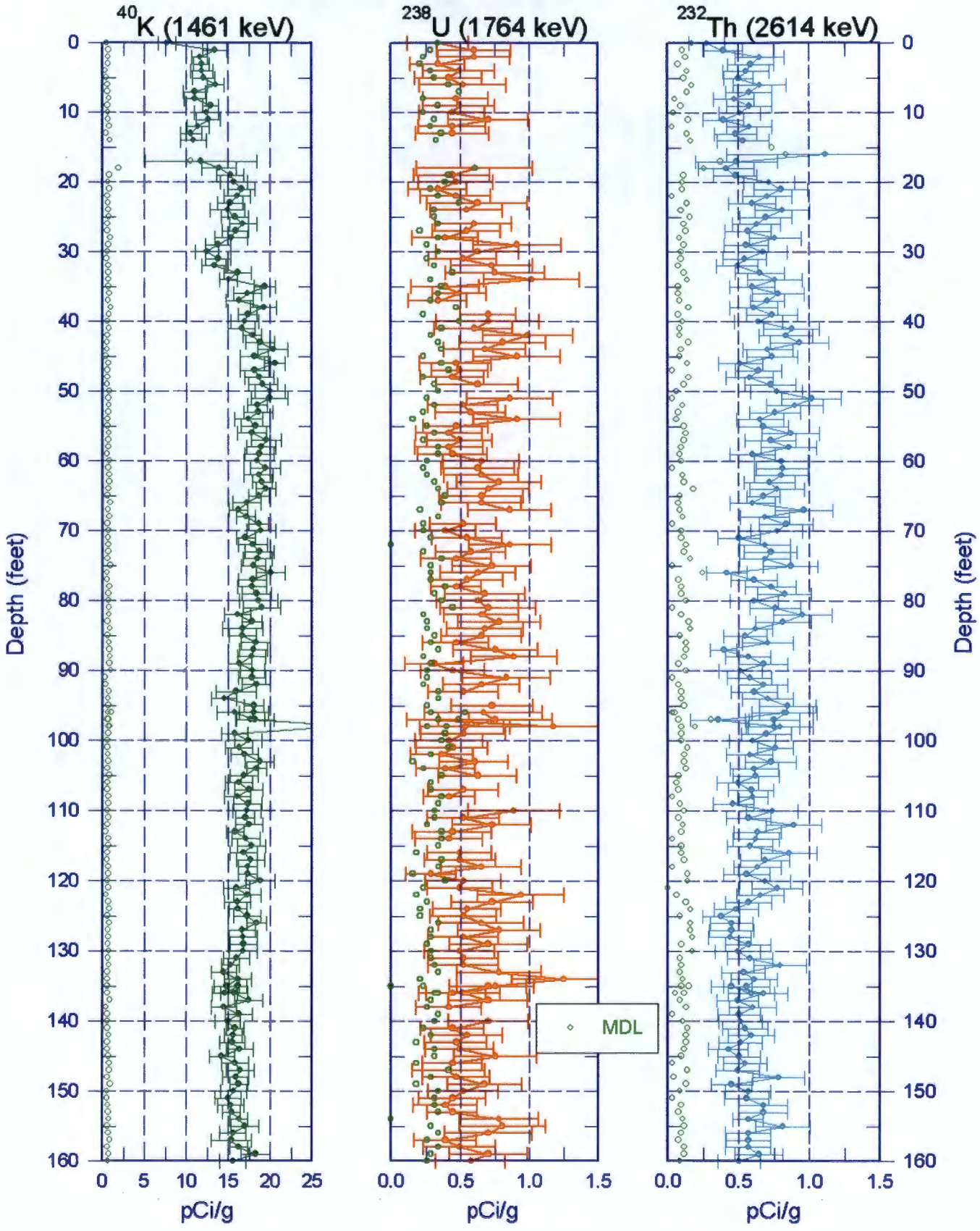
299-E33-341 (C5856)
Natural Gamma Logs



Zero Reference - Ground surface

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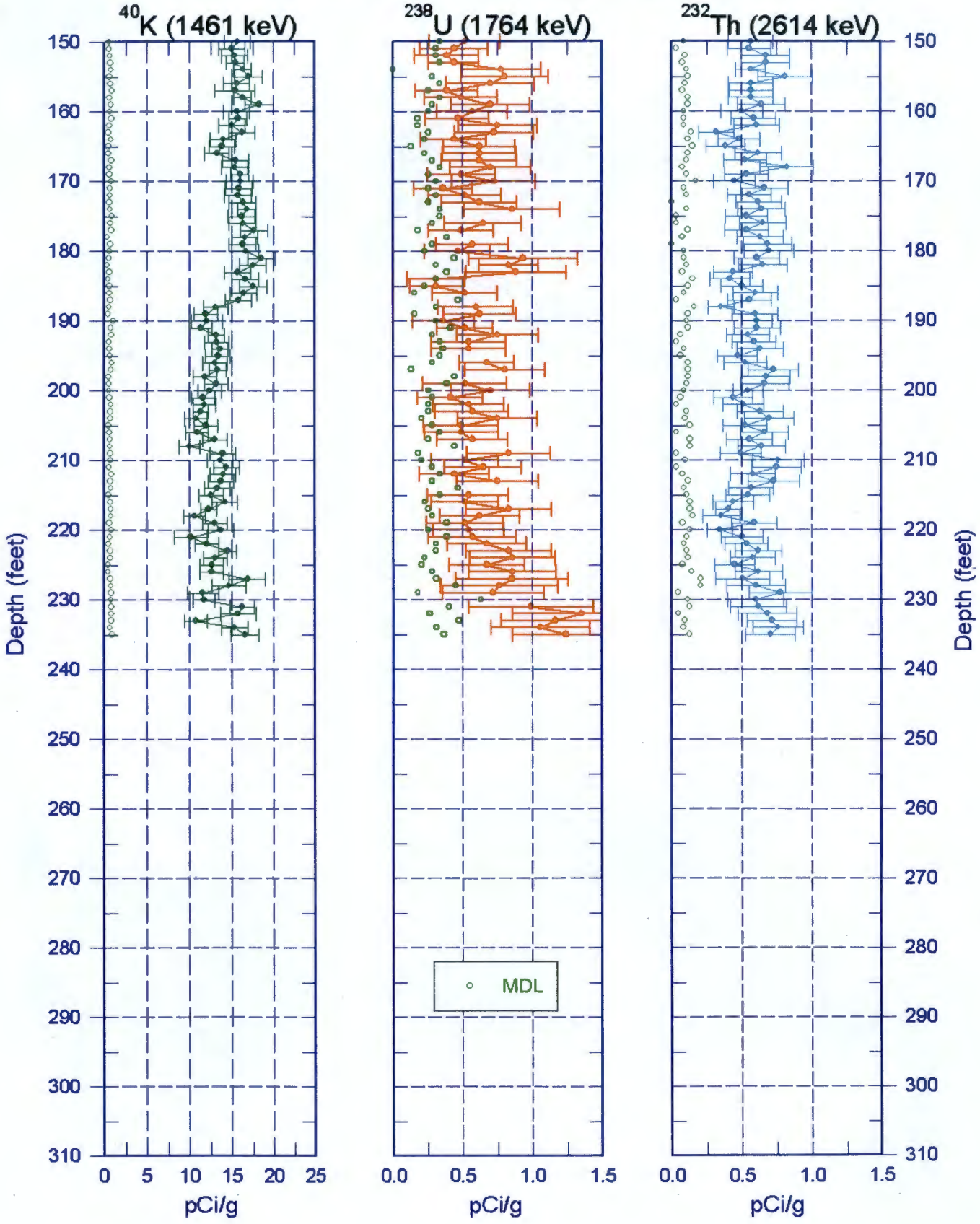
299-E33-341 (C5856)
Natural Gamma Logs



Zero Reference - Ground surface

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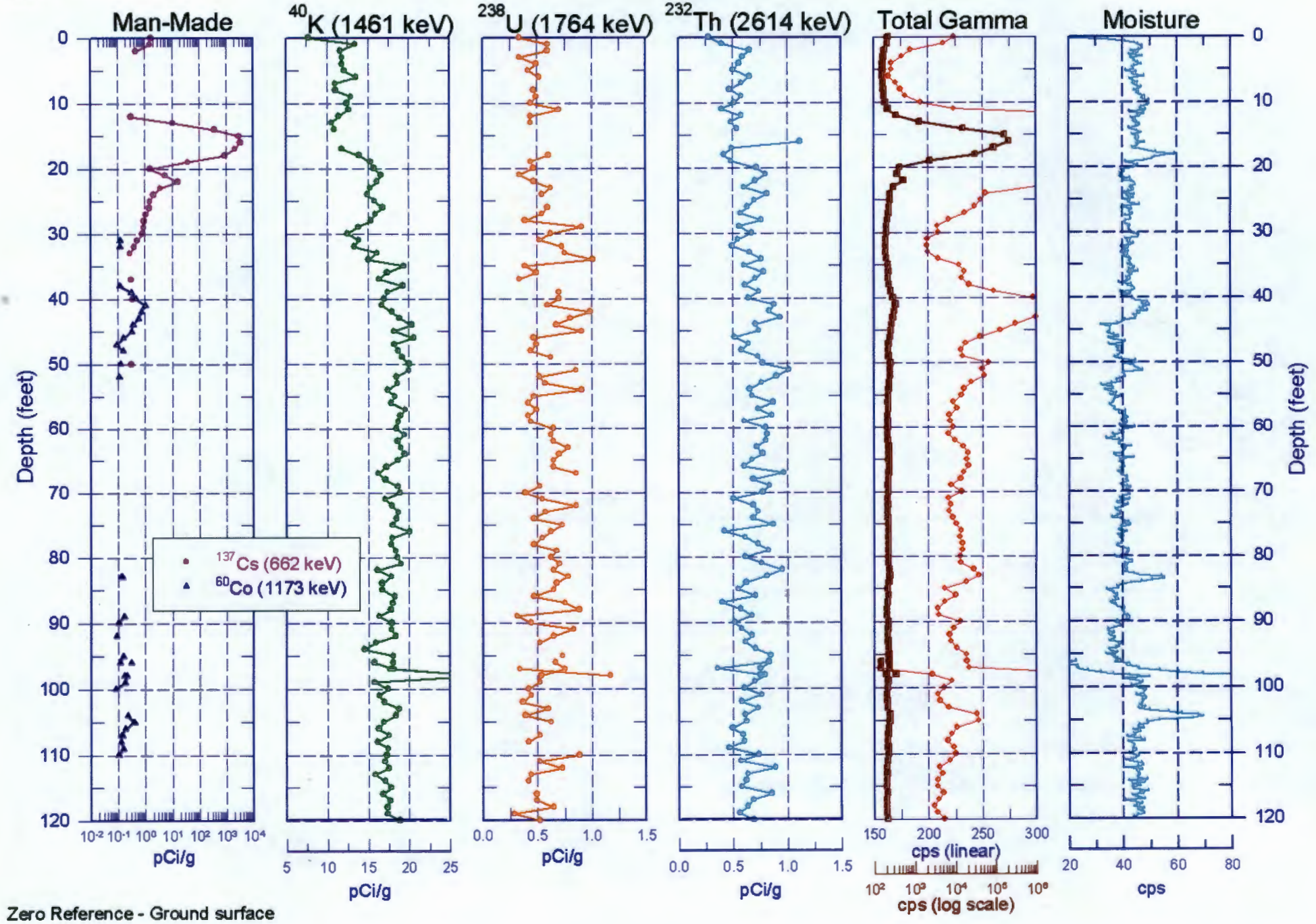
299-E33-341 (C5856) Combination Plot



Zero Reference - Ground surface

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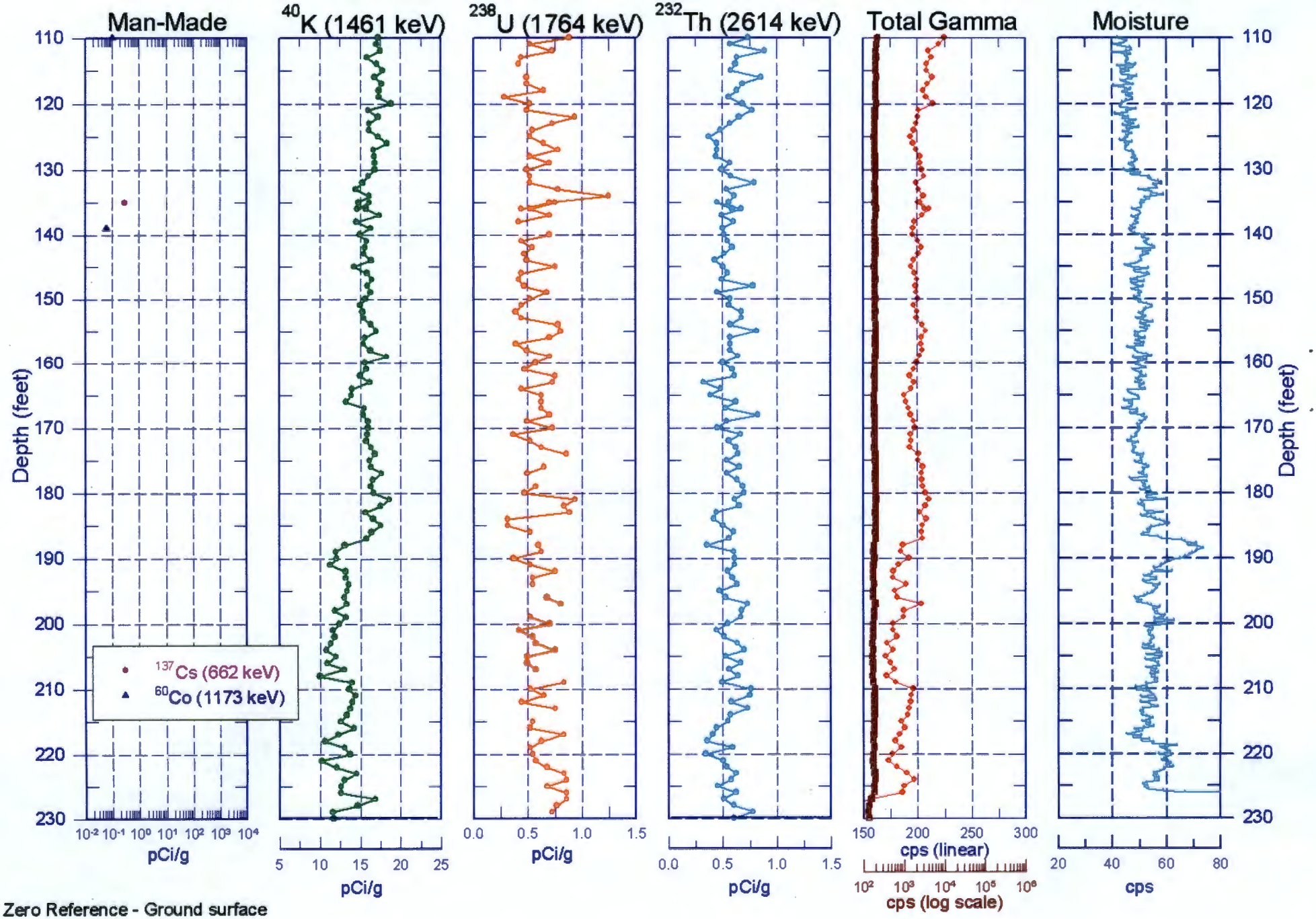
299-E33-341 (C5856) Combination Plot



Zero Reference - Ground surface

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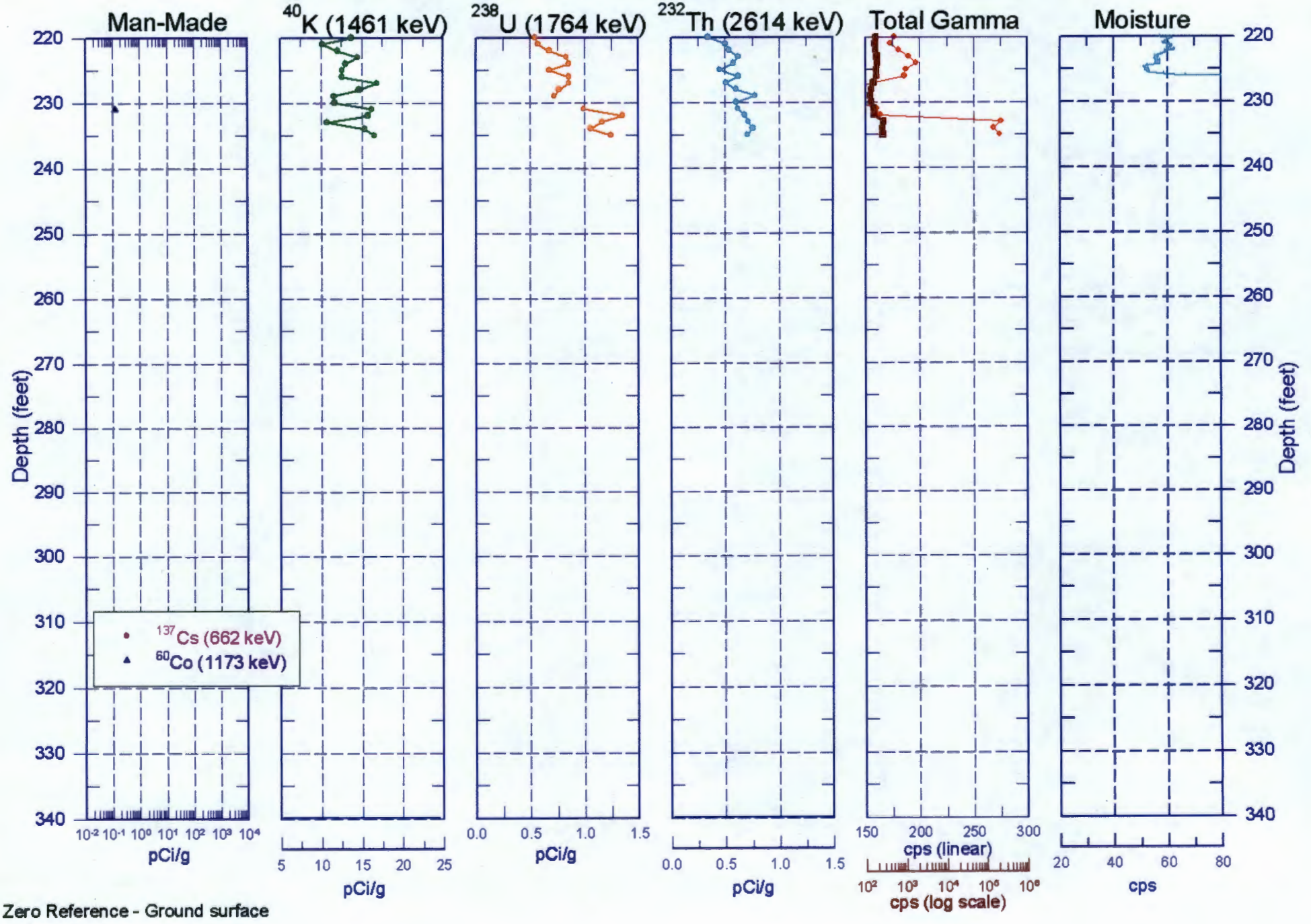
299-E33-341 (C5856) Combination Plot



Zero Reference - Ground surface

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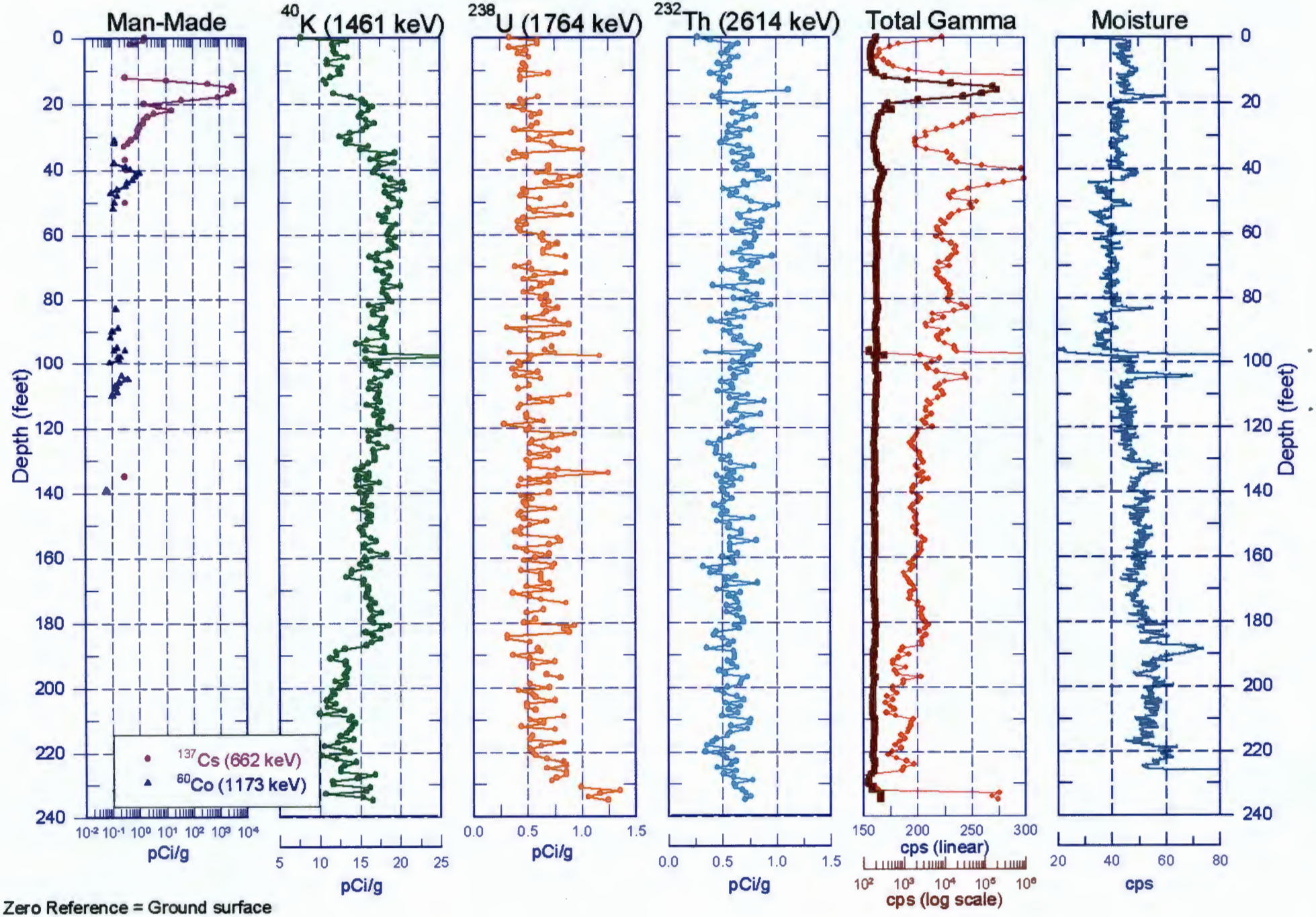
299-E33-341 (C5856) Combination Plot



Zero Reference = Ground surface

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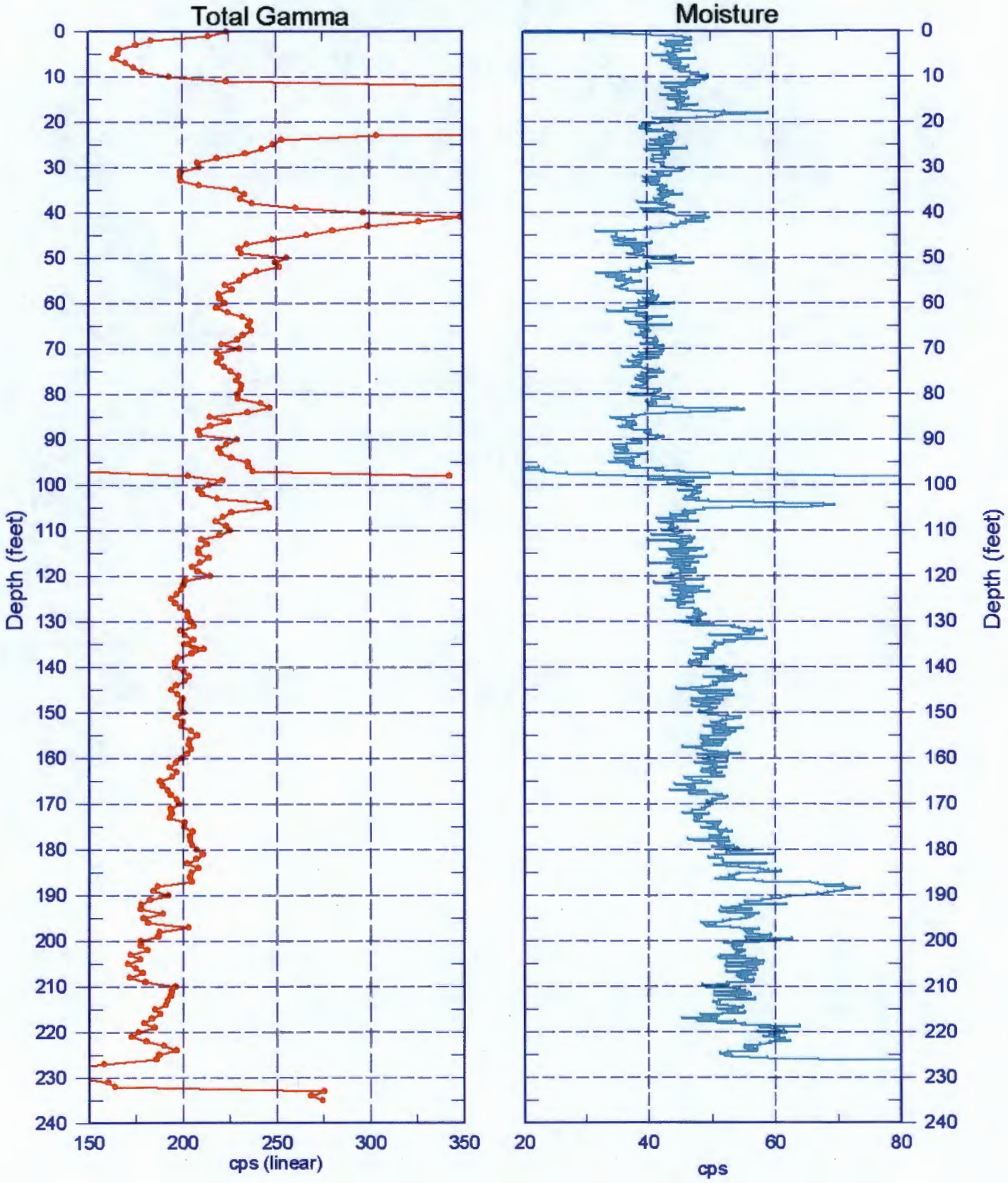
299-E33-341 (C5856)
Total Gamma & Moisture



Reference - Ground Surface

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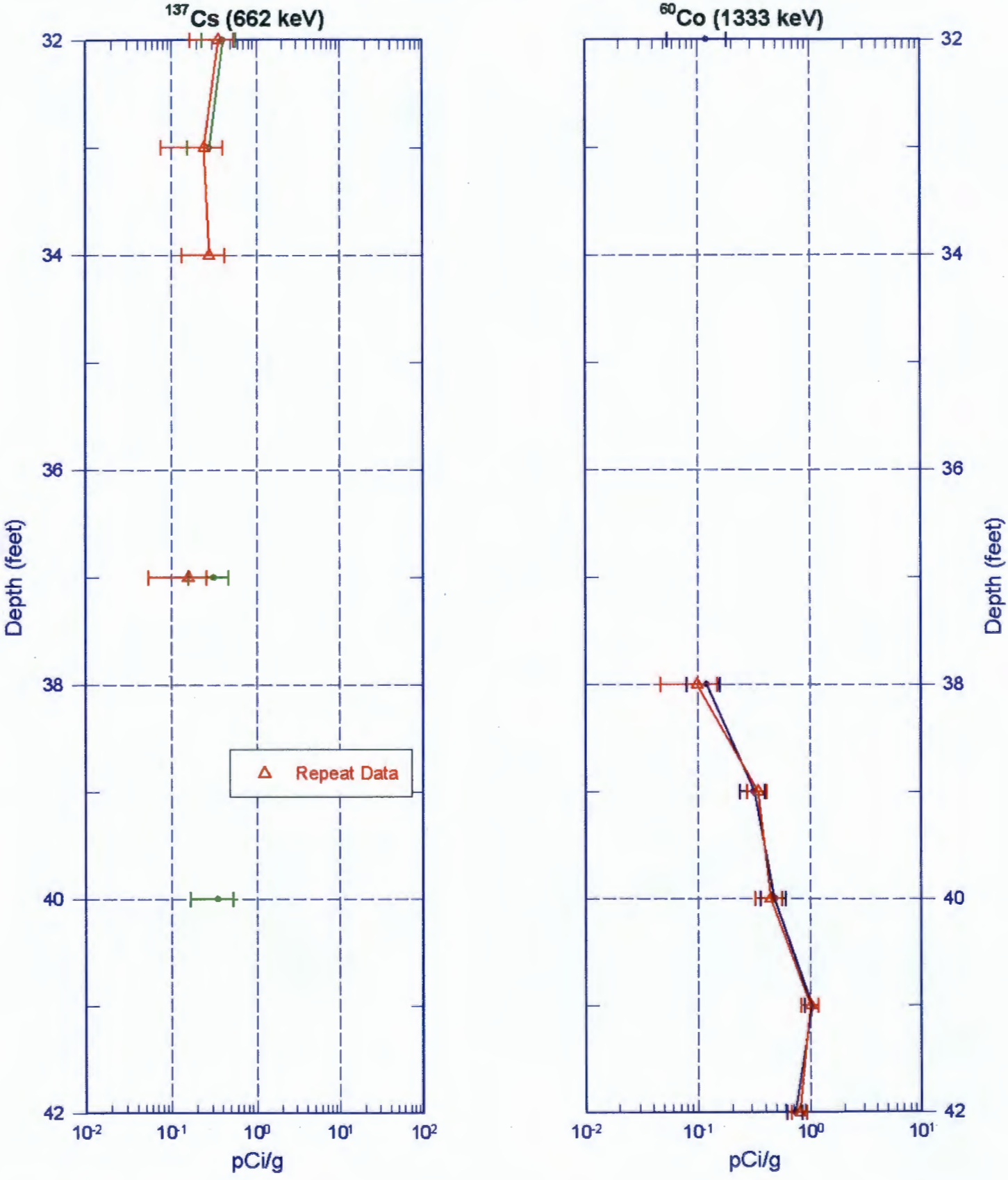
299-E33-341 (C5856)

Repeat of Manmade Radionuclides



Zero Reference - Ground surface

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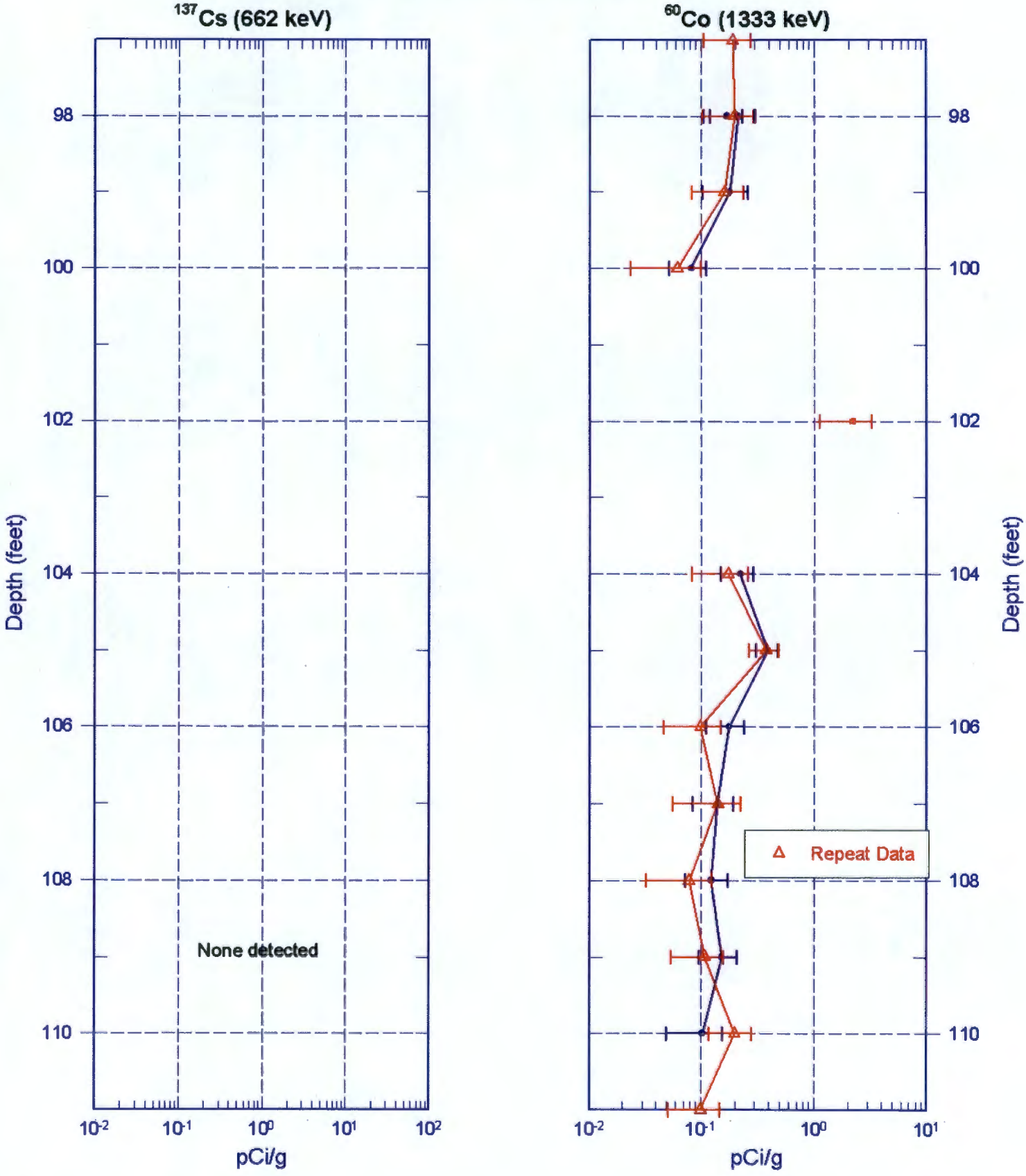
299-E33-341 (C5856)

Repeat of Manmade Radionuclides



Zero Reference - Ground surface

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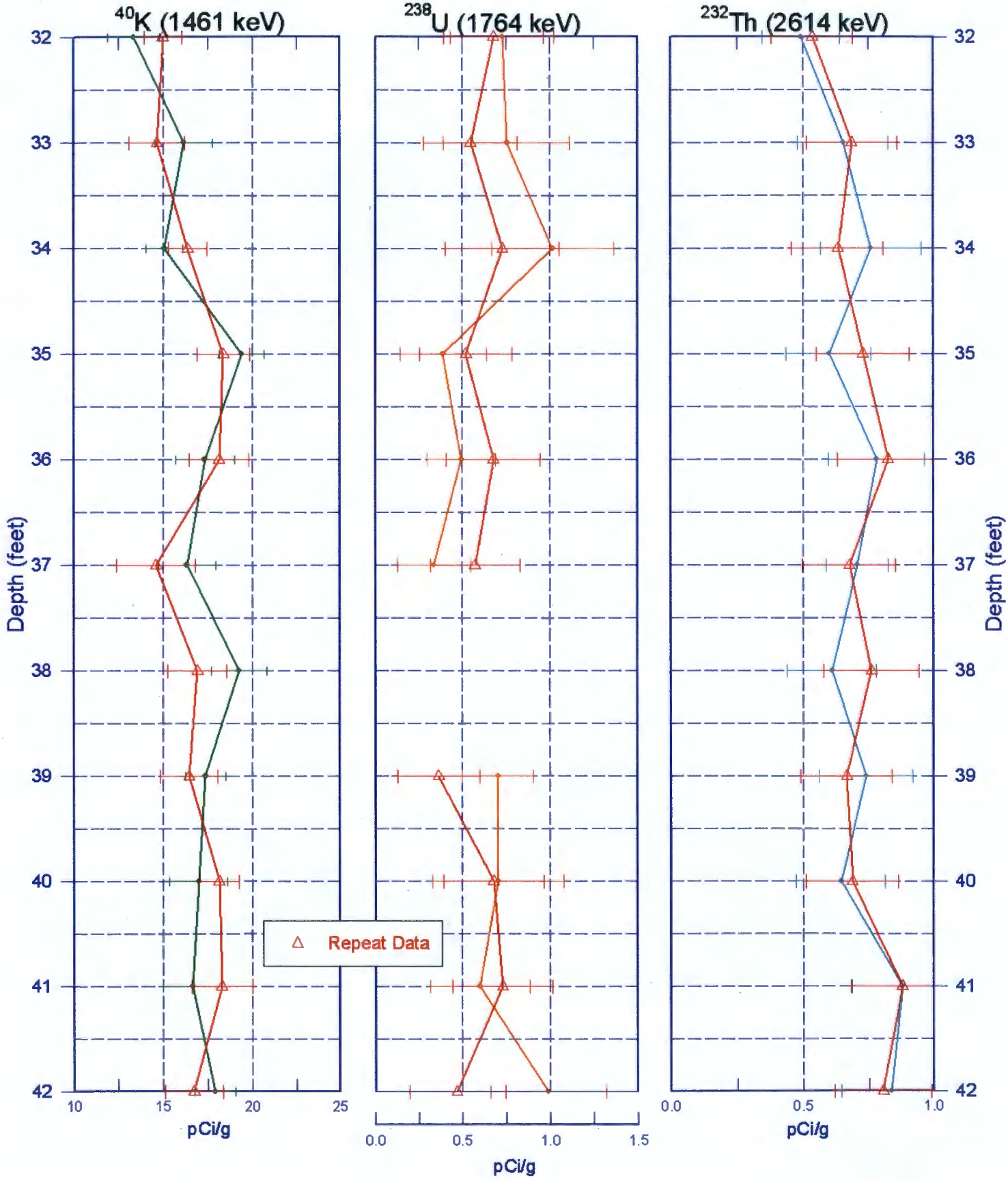
Repeat Section of Natural Gamma Logs



Zero Reference - Ground surface

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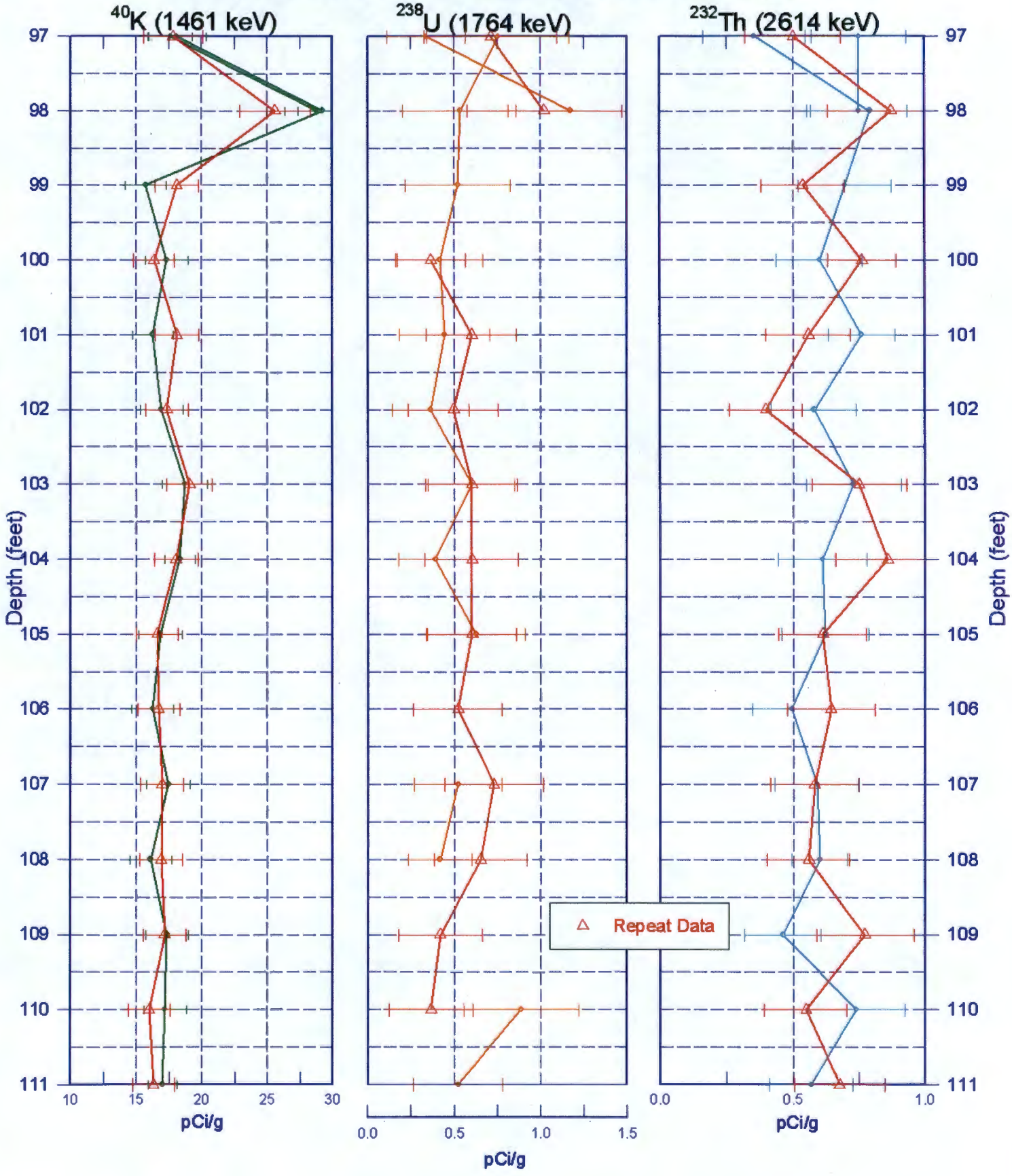
299-E33-341 (C5856)

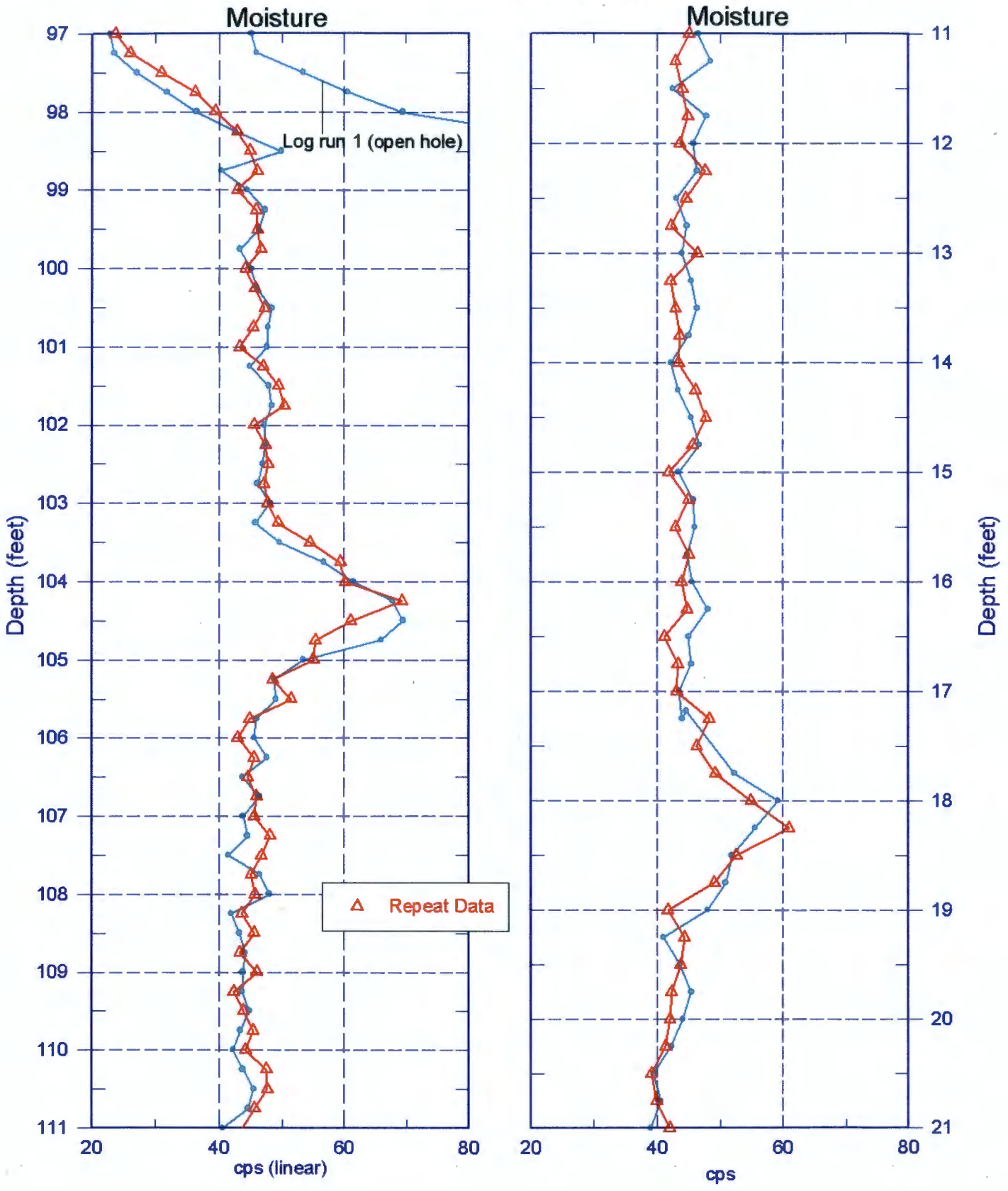
Repeat Section of Natural Gamma Logs



Zero Reference - Ground surface

299-E33-341 (C5856)

Repeat Section for Moisture



Reference - Ground surface