Stoller
Hanford Office

HGLP-LDR-038, Rev. 1

C5301
Log Data Report

Borehole Information:

Borehole:	C5301		Site:	216-A-4 Crib	
Coordinates (WA St Plane)		GWL[1] (ft) :	314.1	GWL Date:	01/11/07
North (m)	East (m)	Drill Date	TOC Elevation	Total Depth (ft)	Type
Not available	Not available	01/07	Not available	355	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded Steel	0.5	10 3/4	9 5/8	9/16	0.5	85
Threaded Steel	4.3	8 3/4	7 3/4	1/2	4.3	355

Borehole Notes:

This borehole was first logged in December 2006 in the first casing string from the ground surface to 85 ft; a Log Data Report was issued for this logging event. Additional log data were acquired in January 2007 from 84 to 355 ft. The original Log Data Report is revised to include the data from the second logging event.

The logging engineer measured the casing diameters using a caliper and steel tape. Logging data acquisition is referenced to the ground surface. The same logging systems were used to acquire data for both logging events.

Logging Equipment Information:

Logging System:	Gamma 4N		Type:	SGLS (60%) SN: 45-TP22010A
Effective Calibration Date:	04/06/06	Calibration Reference:	DOE-EM/GJ1177-2006	
		Logging Procedure:	HGLP-MAN-002, Rev. 2	

Logging System:	Gamma 4H		Type:	NMLS SN: H310700352
Effective Calibration Date:	11/22/06	Calibration Reference:	HGLP-CC-002	
		Logging Procedure:	HGLP-MAN-002, Rev. 2	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat	5	6 Repeat	7
Date	12/06/06	12/06/06	01/15/07	01/15/07	01/15/07
Logging Engineer	Pearson	Pearson	Pearson	Pearson	Pearson
Start Depth (ft)	0.0	46.0	355.0	165.0	137.0
Finish Depth (ft)	85.0	54.0	136.0	138.0	84.0
Count Time (sec)	200	400	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
ft/min	N/A[2]	N/A	N/A	N/A	N/A
Pre-Verification	DN501CAB	DN501CAB	DN621CAB	DN631CAB	DN631CAB
Start File	DN501000	DN501086	DN621000	DN631000	DN631028

Log Run	1	2 Repeat	5	6 Repeat	7
Finish File	DN501085	DN501102	DN621219	DN631027	DN631081
Post-Verification	DN501CAA	DN501CAA	DN621CAA	DN631CAA	DN631CAA
Depth Return Error (in.)	N/A	- 1	- 3.5	N/A	0
Comments	No fine-gain adjustment.	No fine-gain adjustment.	No fine-gain adjustment.	No fine-gain adjustment.	No fine-gain adjustment.

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	3	4 Repeat	8	9	10
Date	12/06/06	12/06/06	01/15/07	01/16/07	01/17/07
Logging Engineer	Pearson	Pearson	Pearson	Pearson	Pearson
Start Depth (ft)	0.0	46.0	128.0	216.0	313.75
Finish Depth (ft)	85.0	54.0	84.0	127.0	215.0
Count Time (sec)	15	15	15	15	15
Live/Real	R	R	R	R	R
Shield (Y/N)	N	N	N	N	N
Sample Interval (ft)	0.25	0.25	0.25	0.25	0.25
ft/min	1.0	1.0	1.0	1.0	1.0
Pre-Verification	DH322CAB	DH322CAB	DH402CAB	DH412CAB	DH422CAB
Start File	DH322000	DH322341	DH402000	DH412000	DH422000
Finish File	DH322340	DH322373	DH402176	DH412356	DH422395
Post-Verification	DH322CAA	DH322CAA	DH402CAA	DH412CAA	DH422CAA
Depth Return Error (in.)	N/A	- 0.5	0	- 2	N/A
Comments	None	None	None	None	None

Log Run	11 Repeat				
Date	01/17/07				
Logging Engineer	Pearson				
Start Depth (ft)	300.0				
Finish Depth (ft)	276.0				
Count Time (sec)	15				
Live/Real	R				
Shield (Y/N)	N				
Sample Interval (ft)	0.25				
ft/min	1.0				
Pre-Verification	DH422CAB				
Start File	DH422396				
Finish File	DH422488				
Post-Verification	DH422CAA				
Depth Return Error (in.)	- 2.5				
Comments	None				

Logging Operation Notes:

Logging was conducted with a centralizer on each sonde and measurements are referenced to ground surface.

Analysis Notes:

Analyst:	Henwood	Date:	01/24/07	Reference:	GJO-HGLP 1.6.3, Rev. 0

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

A casing correction for a 9/16-in. thick casing was applied to the SGLS data acquired from the ground surface to 85 ft. Below 85 ft, a correction for a 0.5-in. thick casing was applied.

NMLS data were not converted to volumetric moisture and are reported in counts per second (cps). There are no calibrations available for 7- and 10-in. boreholes. A change in the count rate at 85 ft is due to the change in casing diameter.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with an EXCEL worksheet template identified as G4NApr06.xls using an efficiency function and corrections for casing and dead time as determined from annual calibrations.

A repeat section was collected with the SGLS from 46 to 54 ft at 400 seconds and 0.5 ft intervals to derive additional detail of the highest contamination. For purposes of this report these log data are presented as main log data because of the improved counting statistics. Repeat sections were also acquired for the SGLS and NMLS in the second logging event in January.

Results and Interpretations:

Cs-137 was the only manmade radionuclide detected. It was detected from the ground surface to 23 ft and from 46 to 76 ft. The maximum concentration of 15 pCi/g was recorded at 49 ft.

Log run 1 U-238 data indicate radon (Rn-222) in the borehole after approximately 90 minutes of logging. The Rn-222 daughter, (i.e. Bi-214) apparent concentrations increase steadily, consistent with ingrowth of the daughter from Rn-222, during the remainder of the day's logging. It is most apparent from 46 to 54 ft where the 400 second counting time was utilized and the daughter has apparently reached decay equilibrium with the parent.

Moisture data indicate some variability, most notably from 282 to 296 ft. This interval coincides with relatively elevated KUT concentrations that likely reflect fine-grained sediment such as clay.

The SGLS and NMLS repeat logs show good repeatability.

List of Log Plots:

Depth Reference is ground surface
Depth Scale - 20 ft/inch except for repeat logs

Man-made Radionuclides
Natural Gamma Logs
Combination Plot
Combination Plot (0-360 ft)
Total Gamma, Dead Time, & Moisture
Repeat of Manmade Radionuclides
Repeat of Natural Gamma Logs (46-54 ft)
Repeat of Natural Gamma Logs (138-165 ft)
Repeat of Total Gamma, Dead Time, & Moisture (46-54 ft)
Repeat of Total Gamma, Dead Time, & Moisture (138-165 ft)

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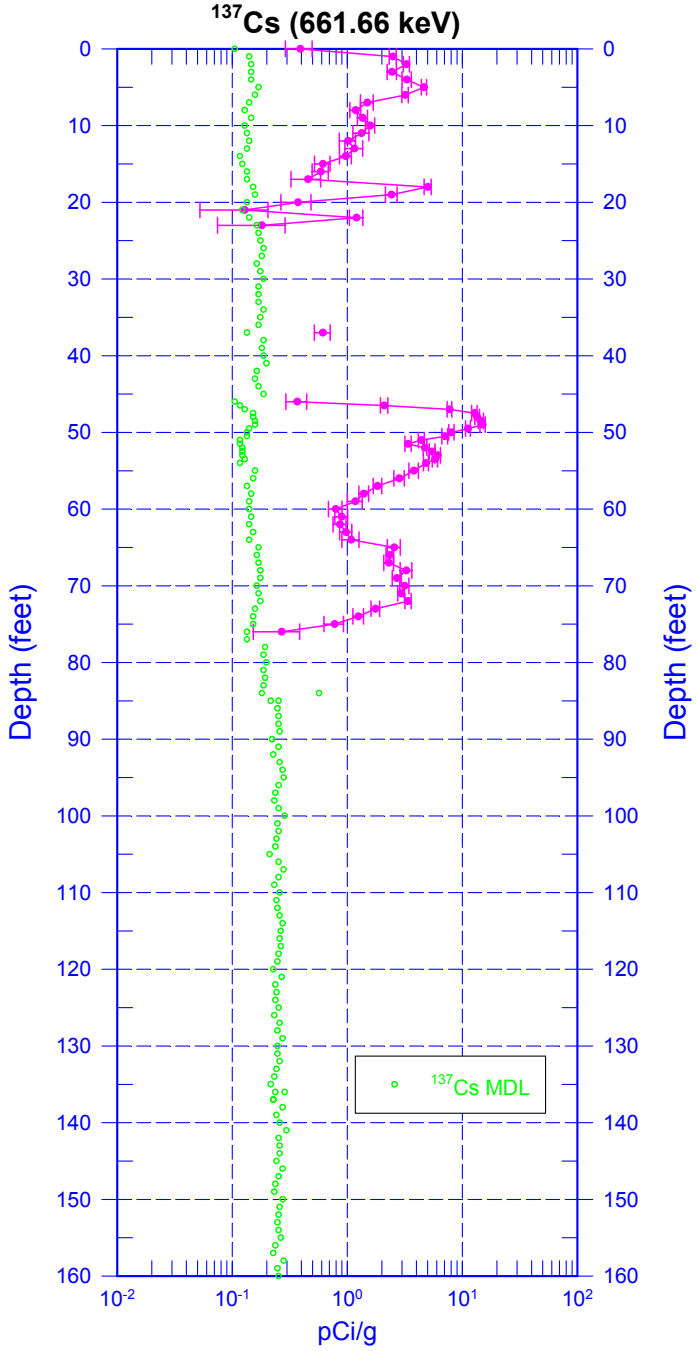
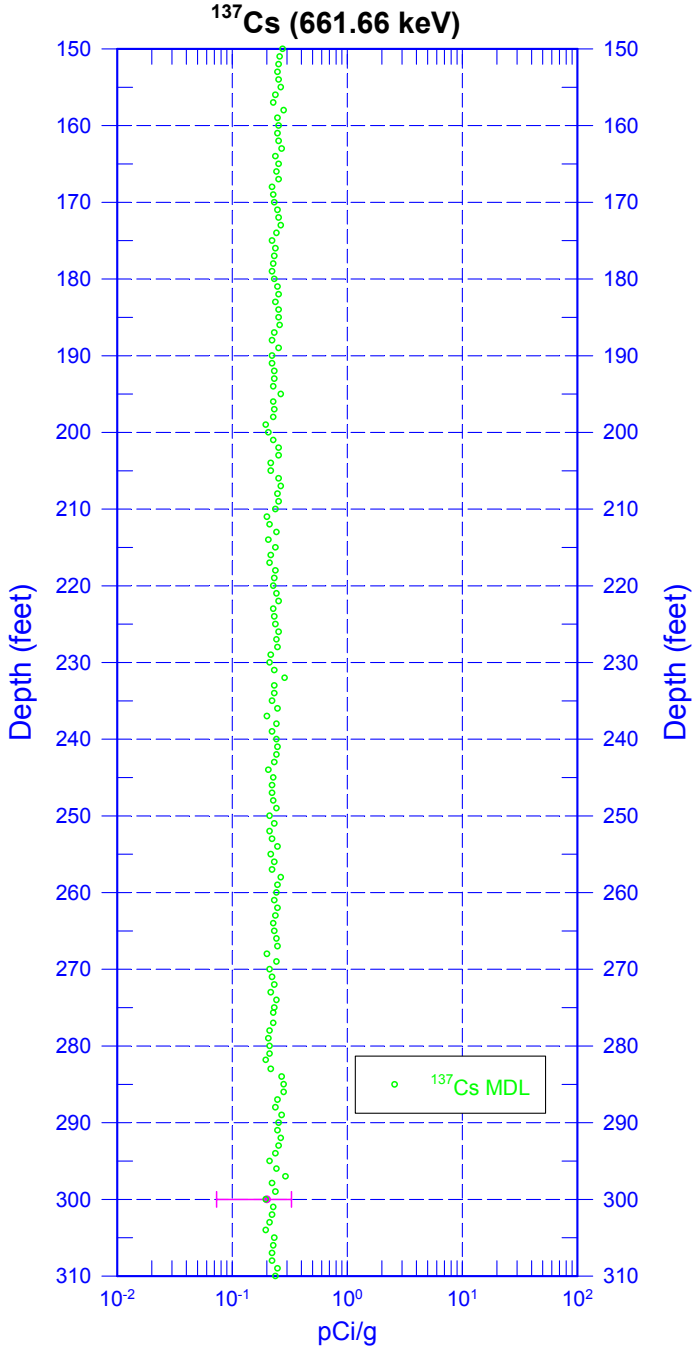
[1] GWL – groundwater level

C5301
Manmade Radionuclides



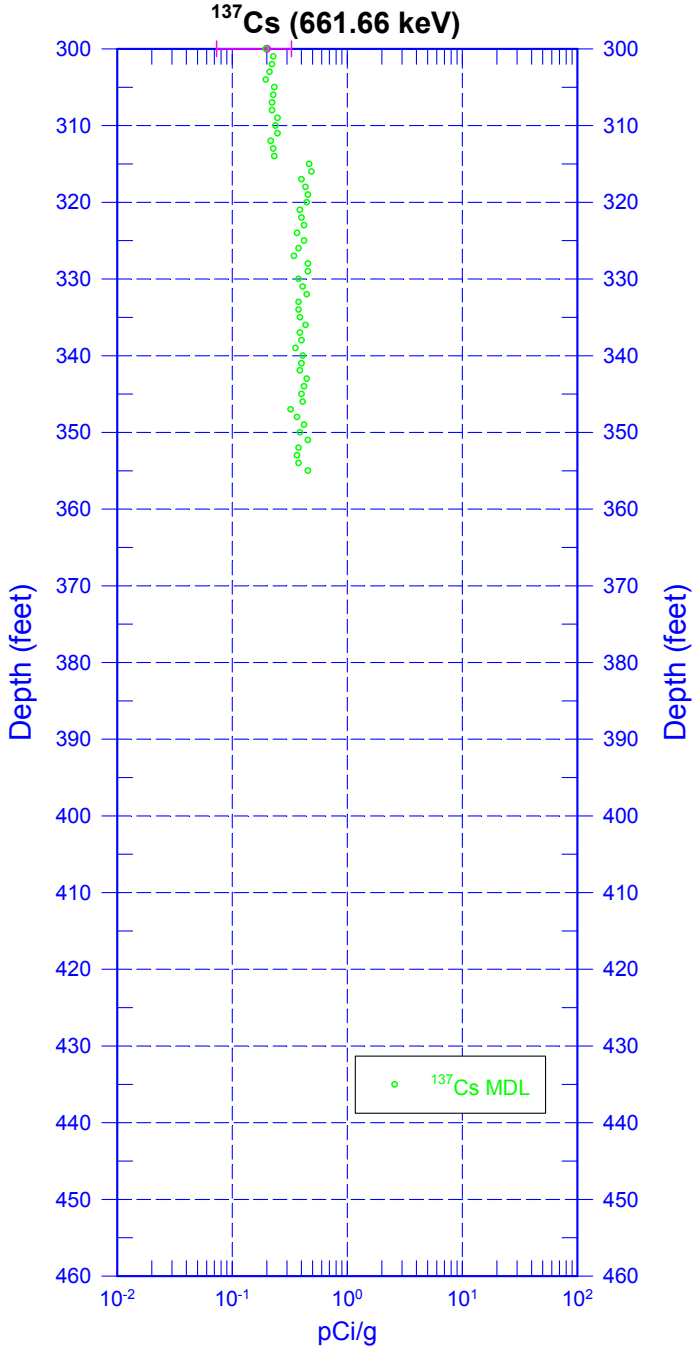
Zero Reference - Ground Surface

C5301
Manmade Radionuclides



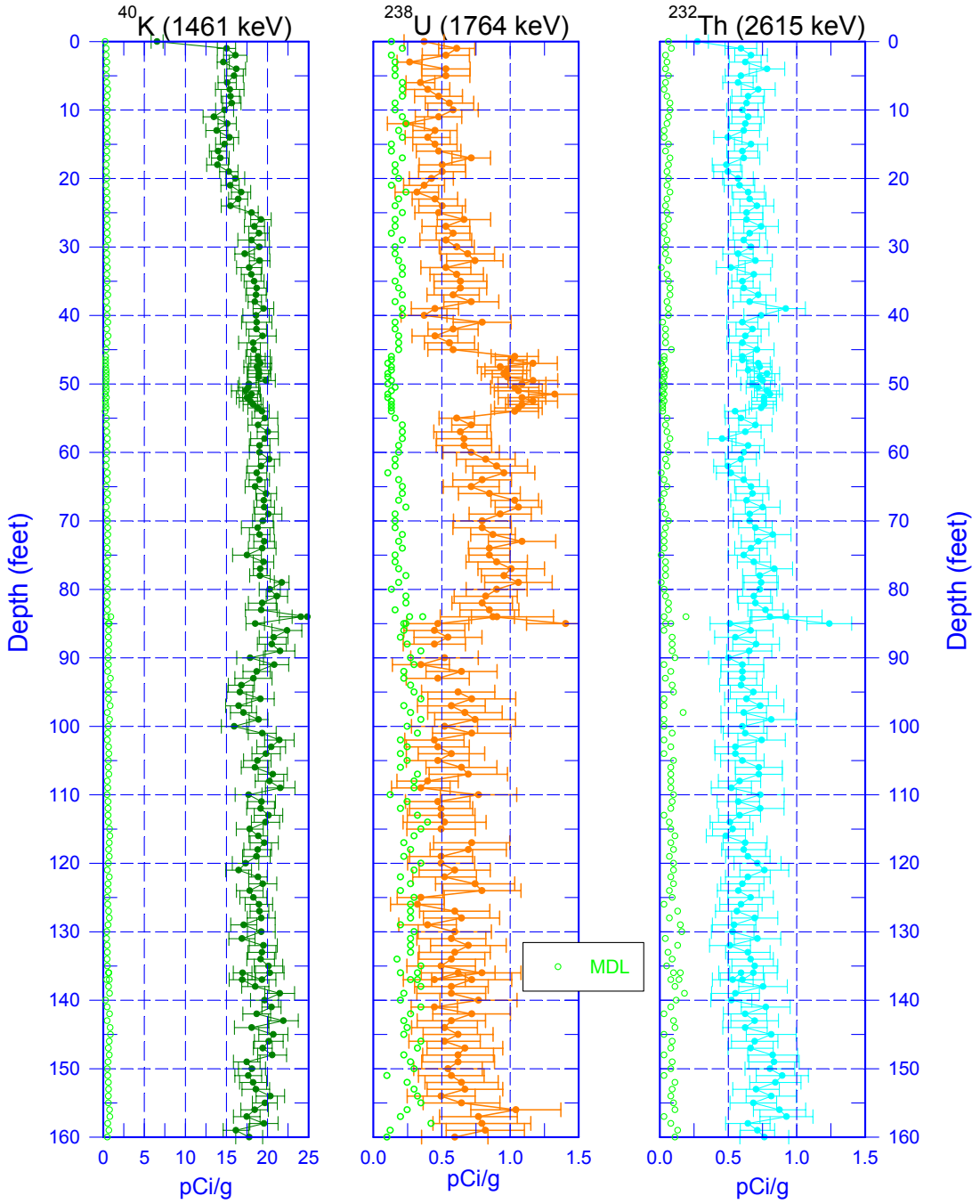
Zero Reference - Ground Surface

C5301
Manmade Radionuclides



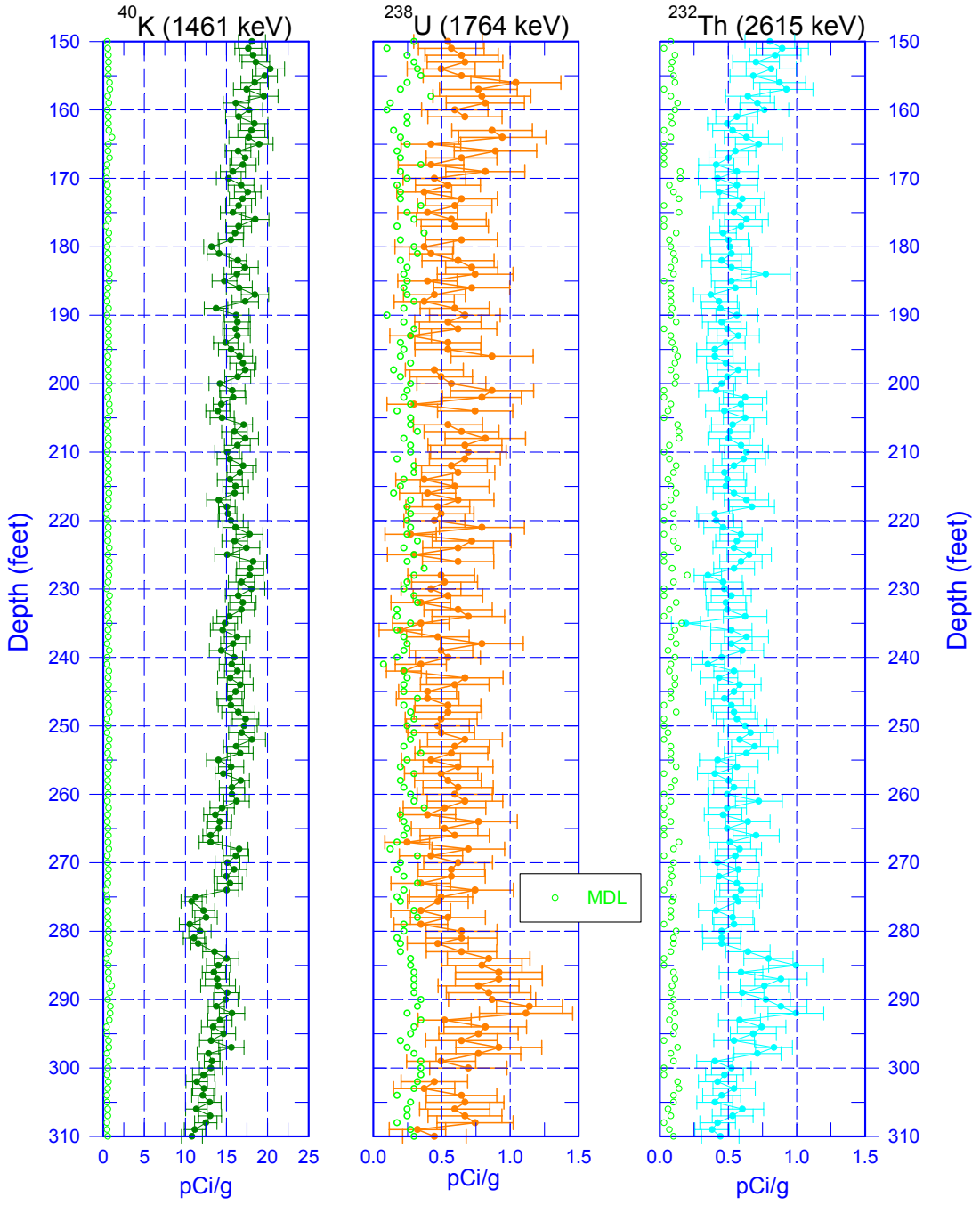
Zero Reference - Ground Surface

C5301
Natural Gamma Logs



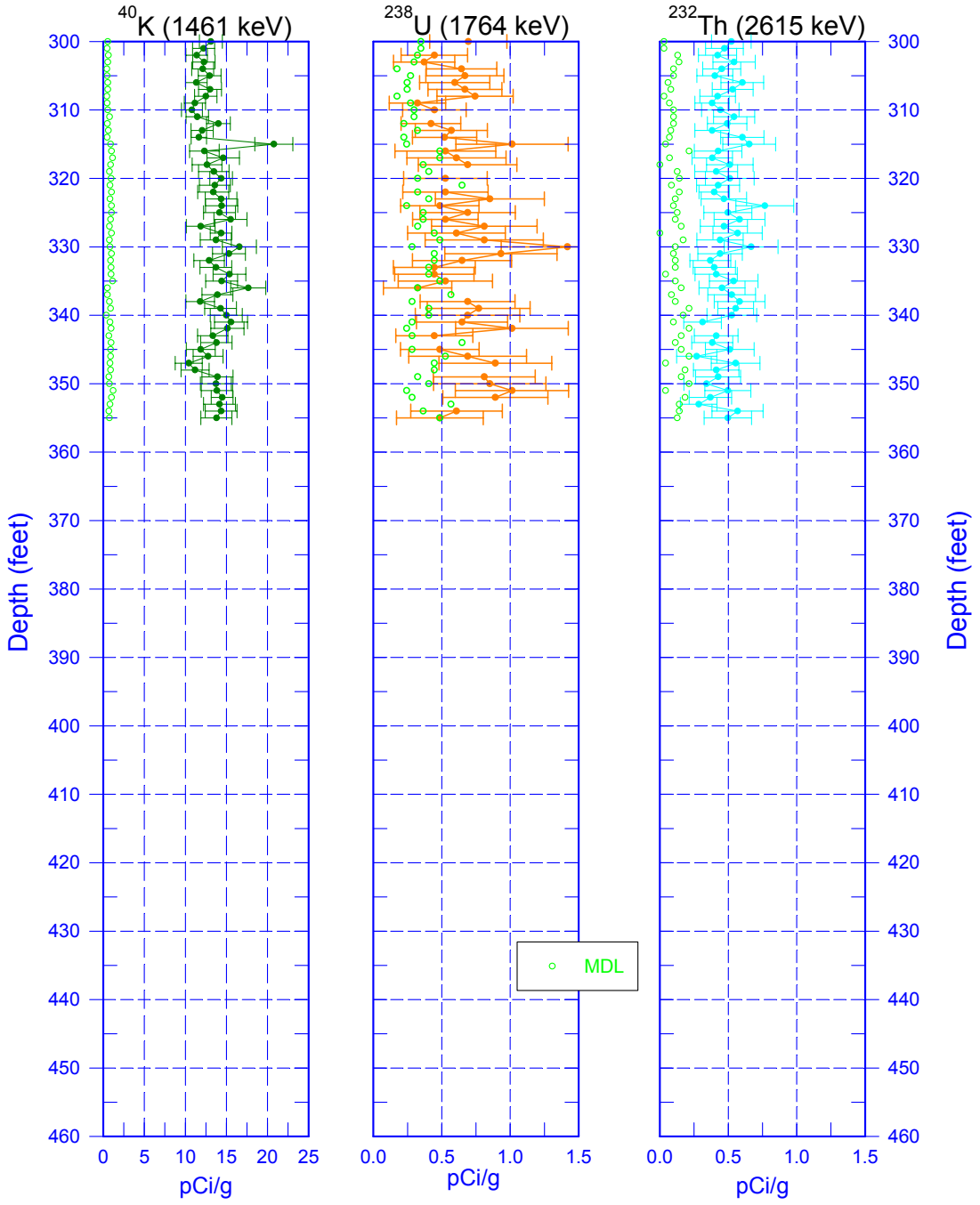
Zero Reference = Ground Surface

C5301
Natural Gamma Logs



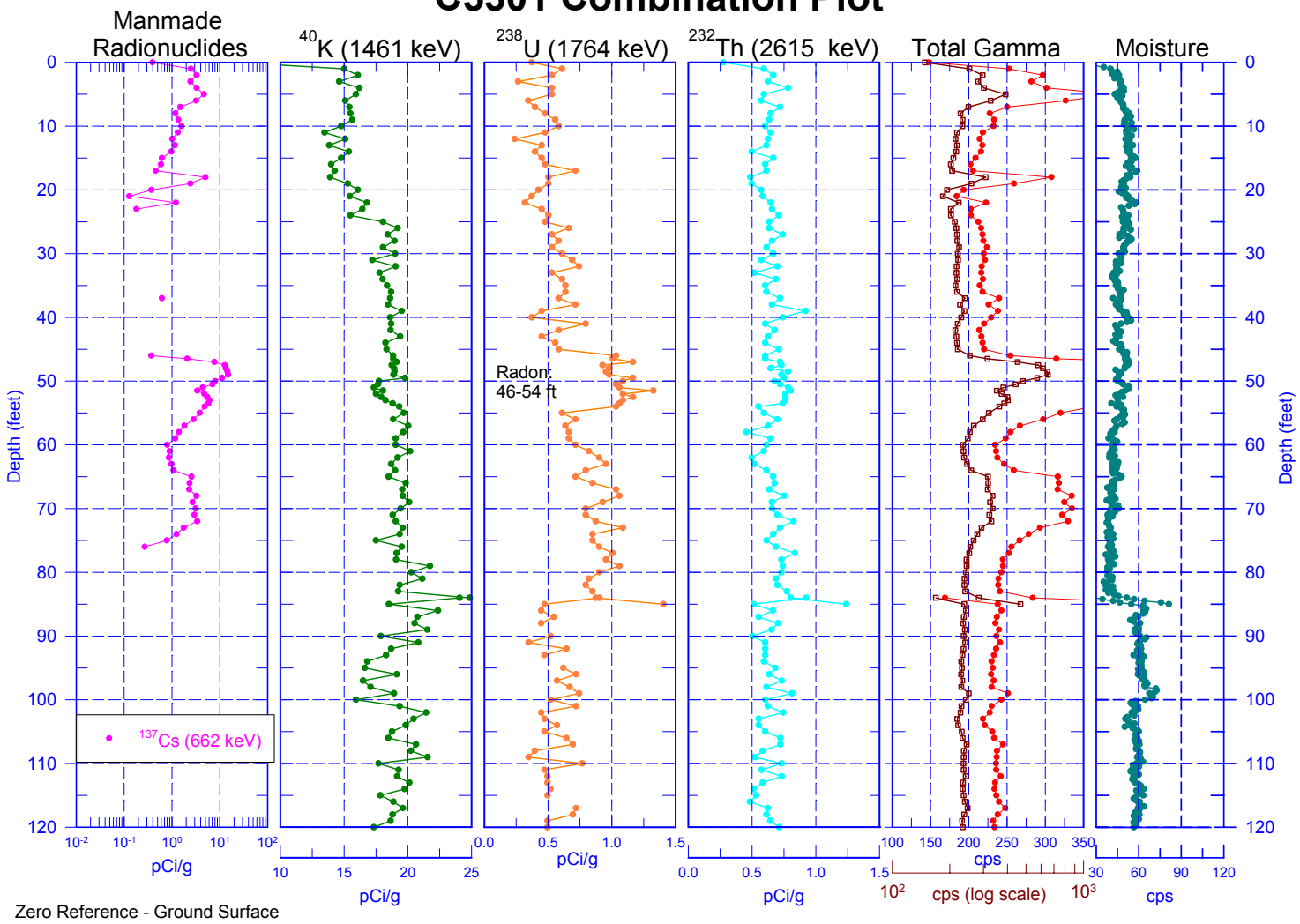
Zero Reference = Ground Surface

C5301
Natural Gamma Logs

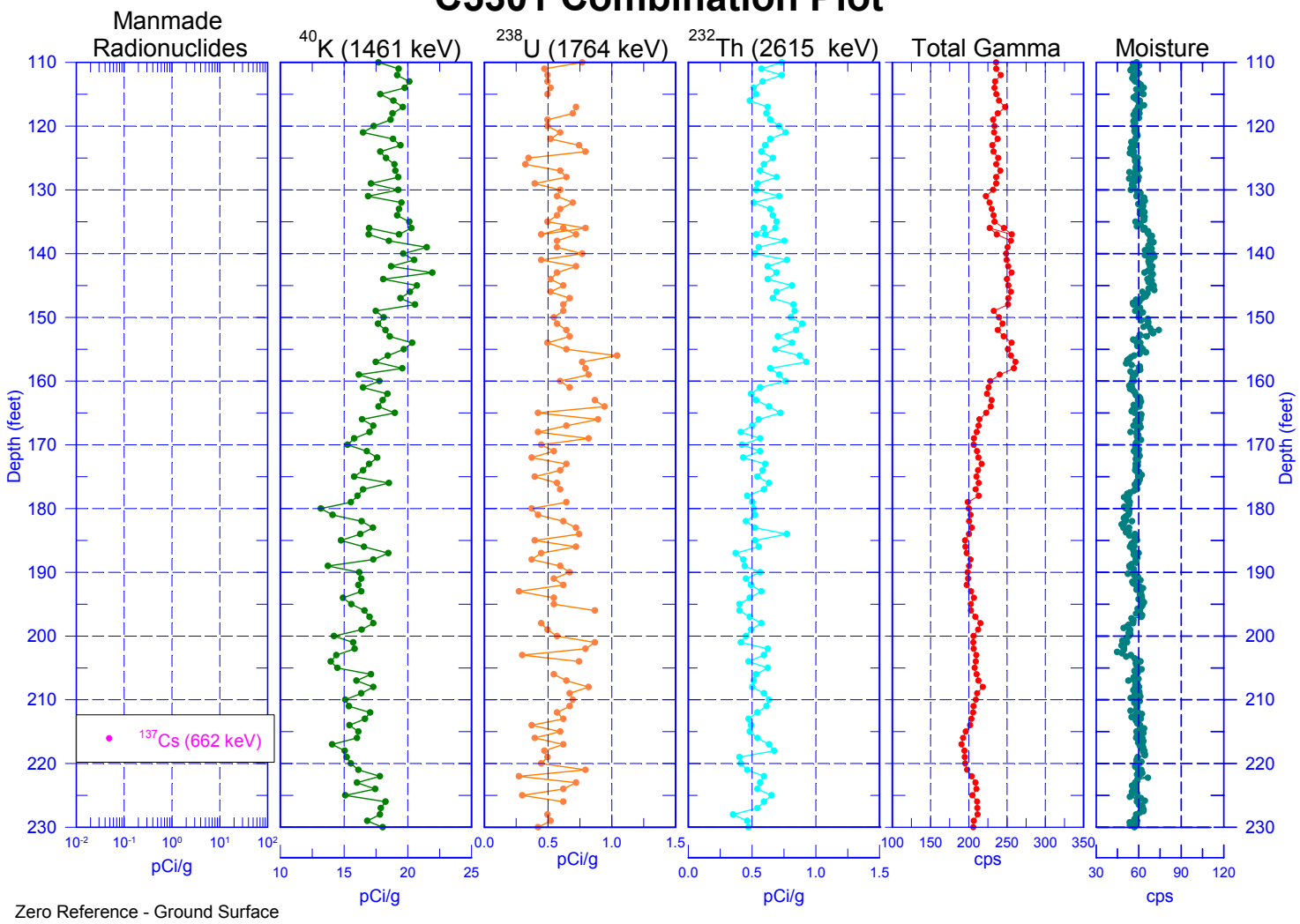


Zero Reference = Ground Surface

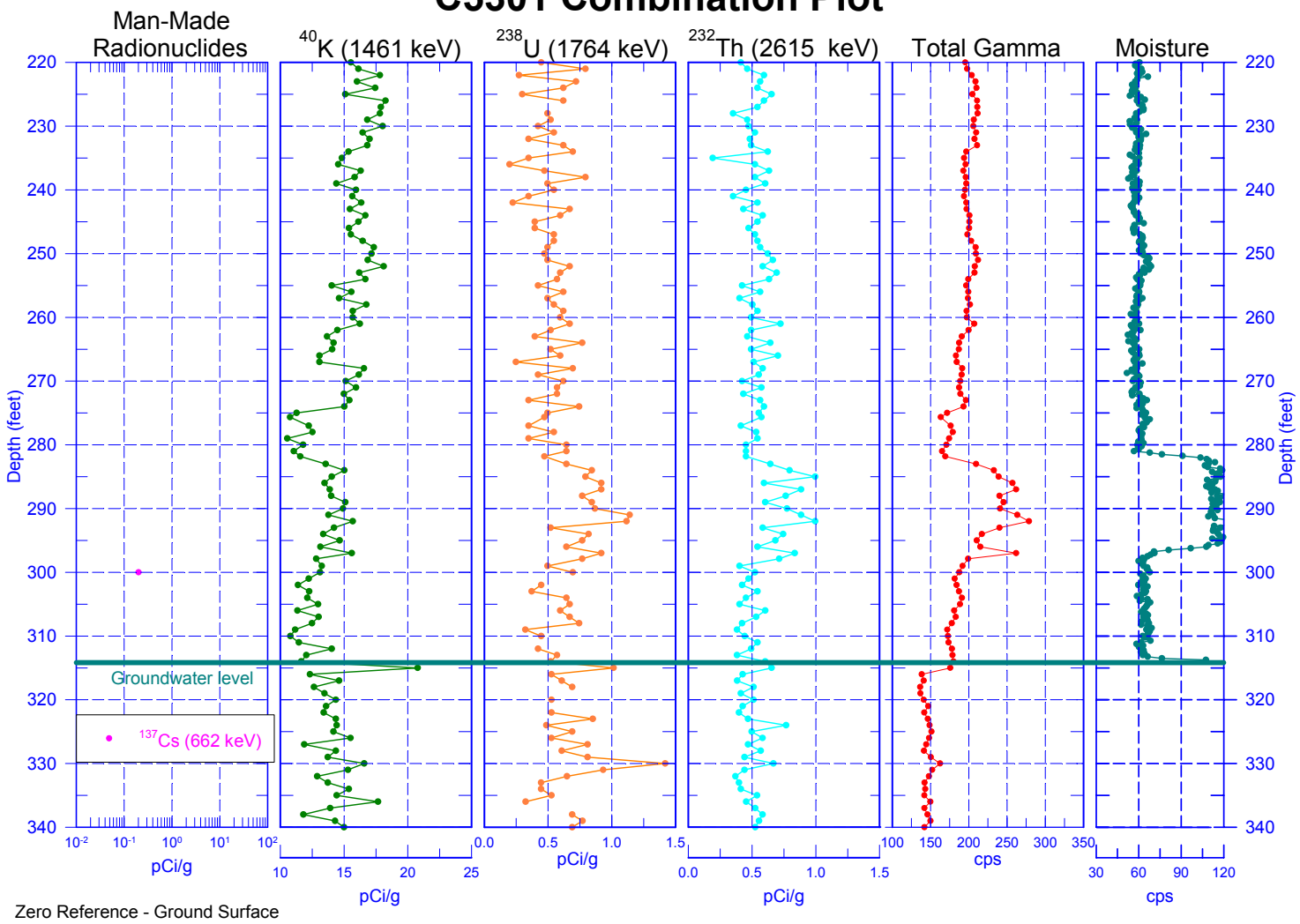
C5301 Combination Plot



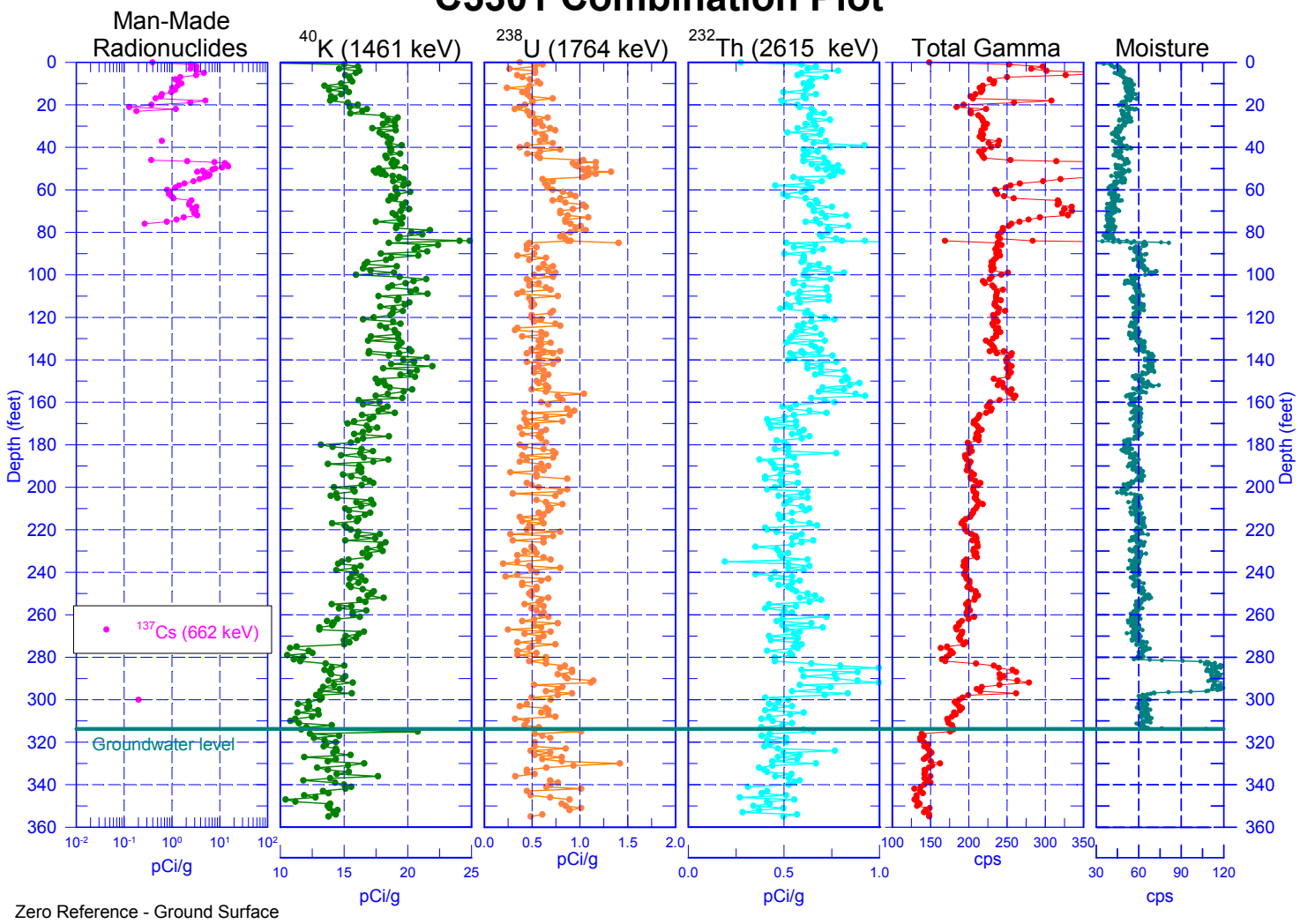
C5301 Combination Plot



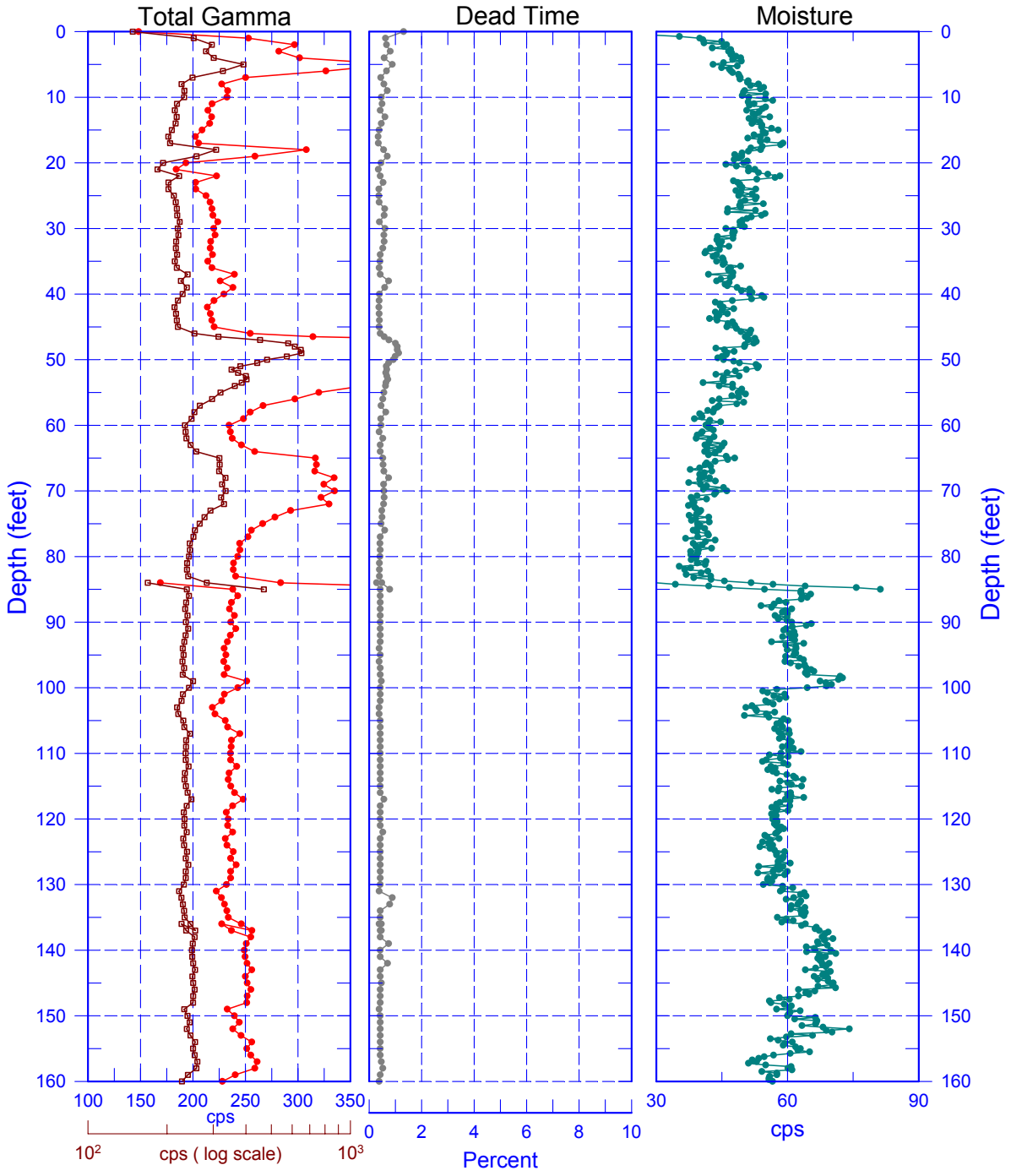
C5301 Combination Plot



C5301 Combination Plot

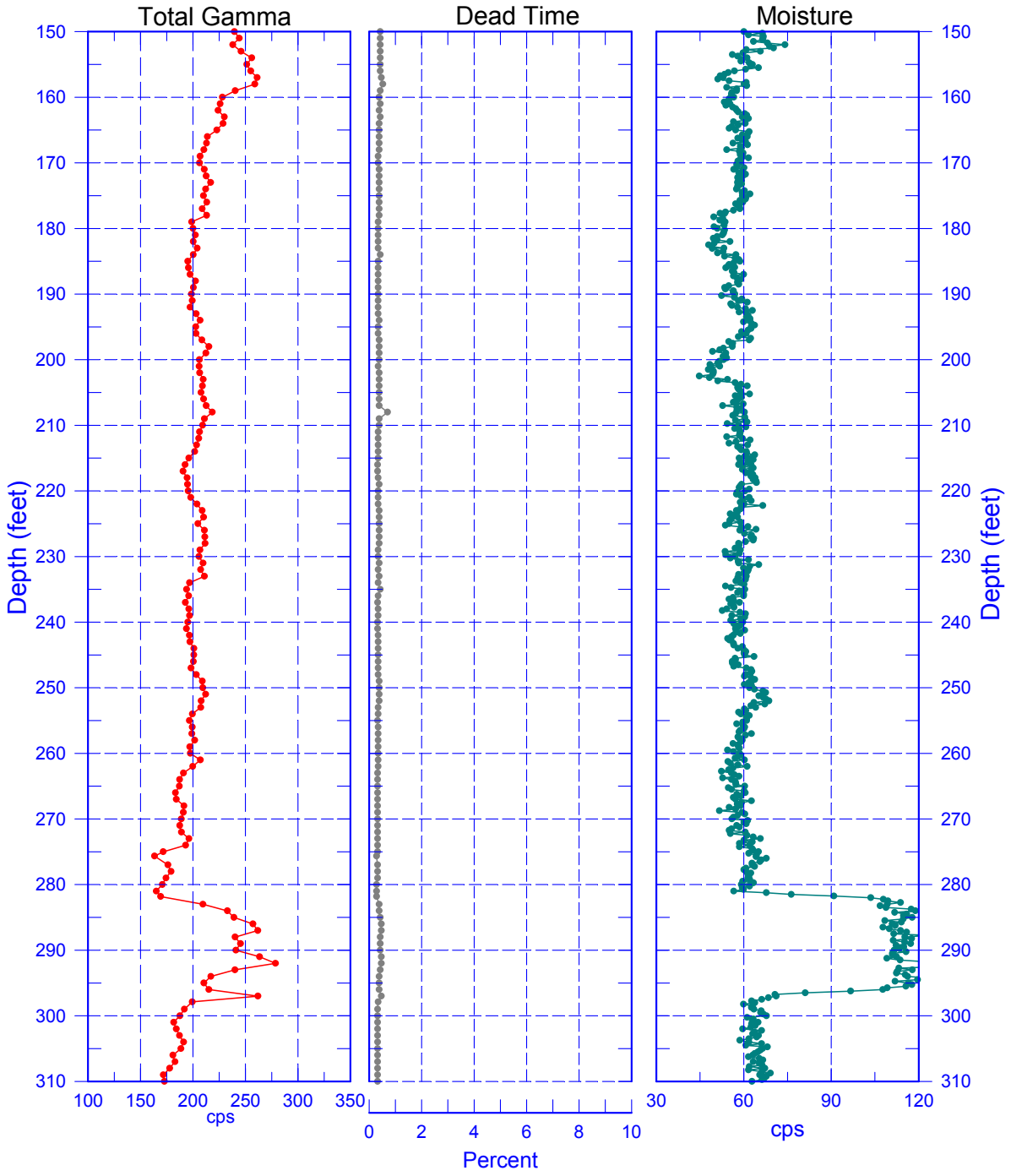


C5301
Total Gamma, Dead Time & Moisture



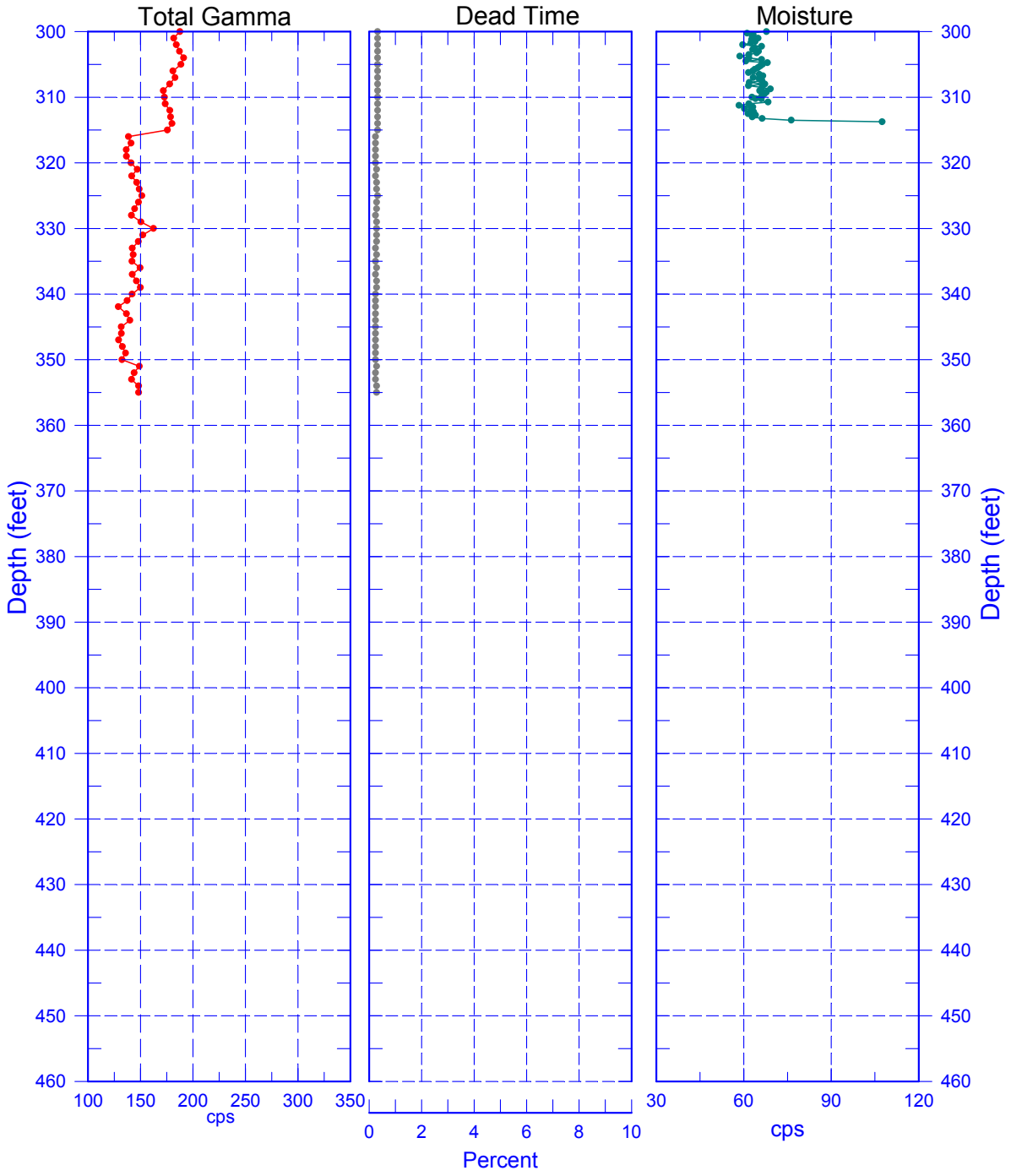
Reference - Ground Surface

C5301
Total Gamma, Dead Time & Moisture



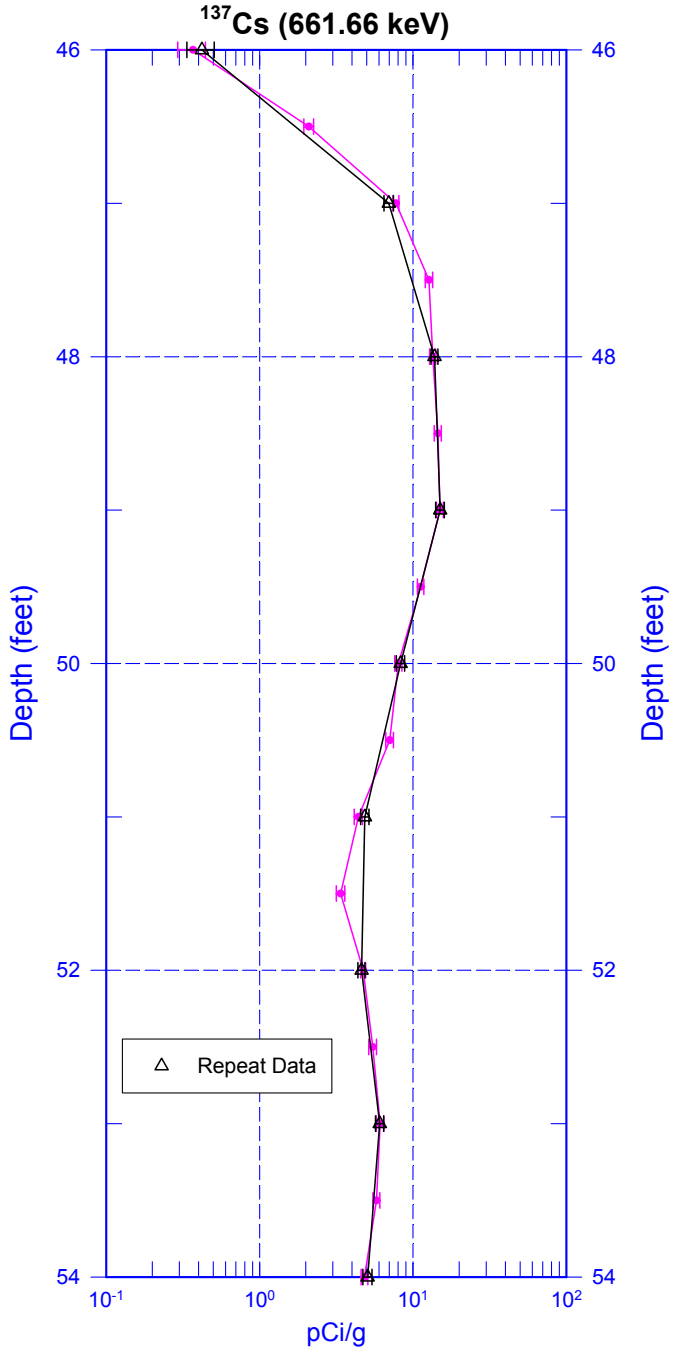
Reference - Ground Surface

C5301
Total Gamma, Dead Time & Moisture



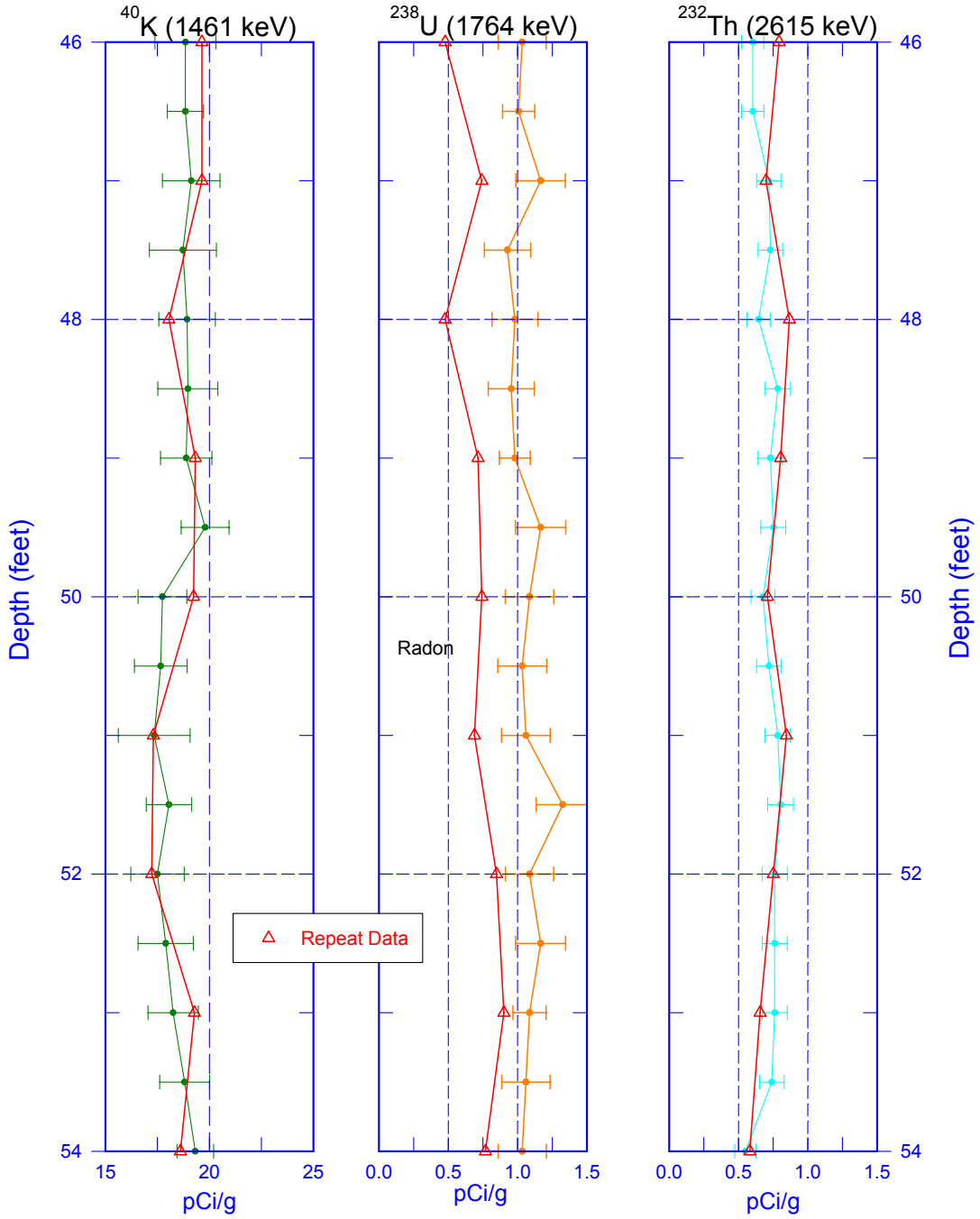
Reference - Ground Surface

C5301
Repeat of Manmade Radionuclides



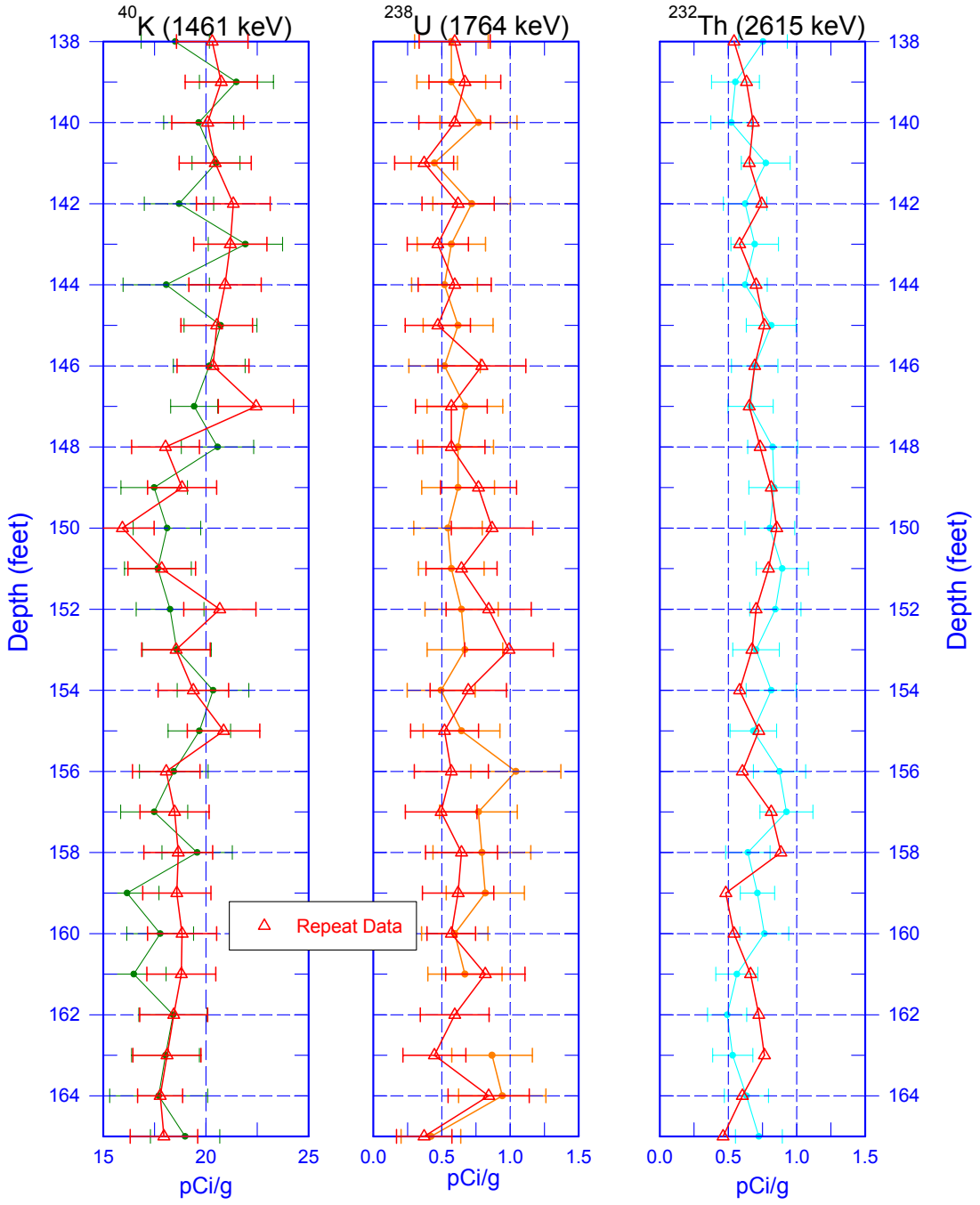
Zero Reference - Ground Surface

C5301
Repeat of Natural Gamma Logs



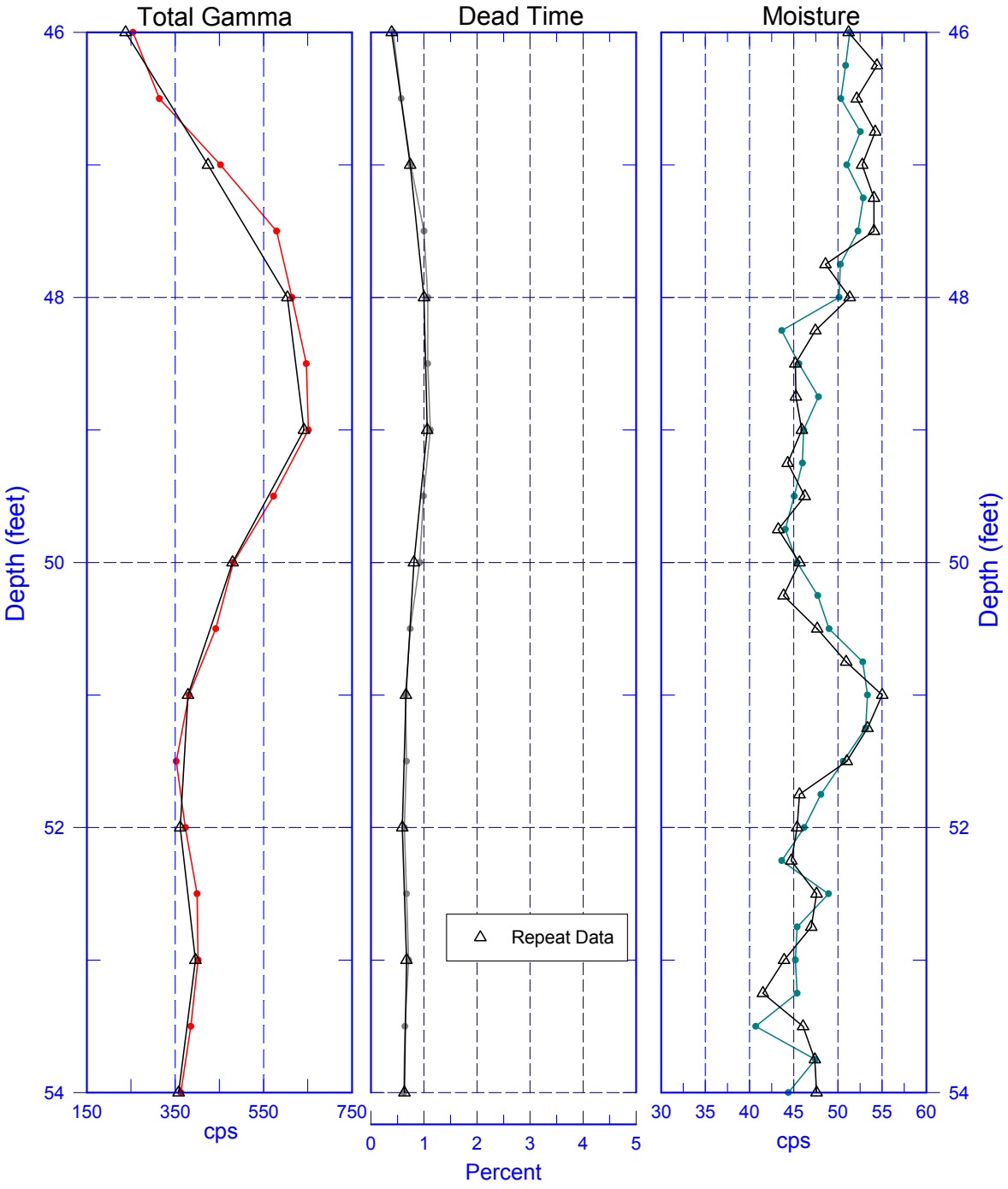
Zero Reference = Ground Surface

C5301
Repeat of Natural Gamma Logs



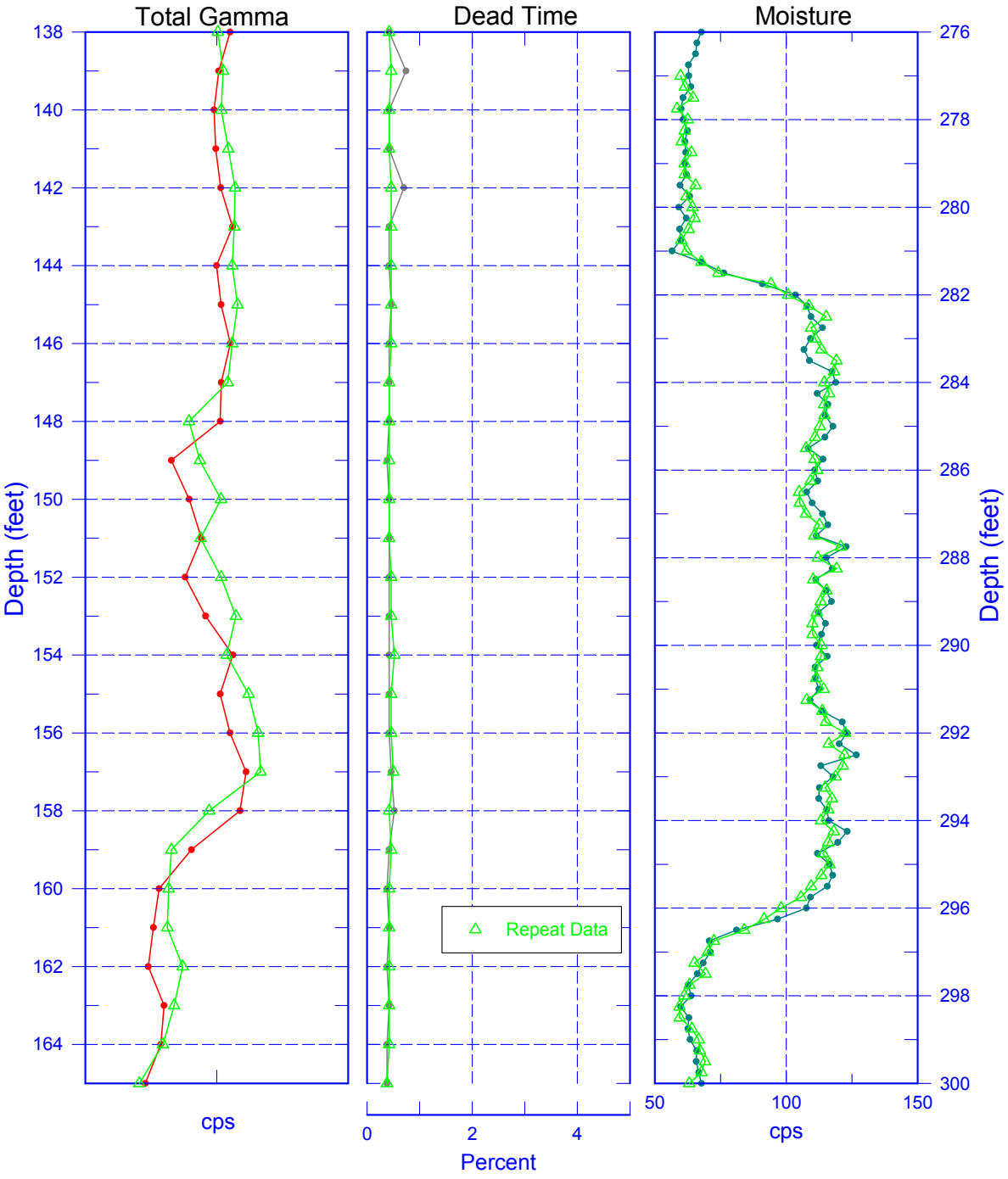
Zero Reference = Ground Surface

C5301
Repeat of Total Gamma, Dead Time & Moisture



Reference - Ground Surface

C5301
Repeat of Total Gamma, Dead Time & Moisture



Reference - Ground Surface