



DOE-EM/GJ859-2005

C4738 Log Data Report

Borehole Information:

Borehole: C4738		Site: 216-T-33 Crib			
Coordinates (WA St Plane)		GWL¹ (ft): None		GWL Date: None	
North (m)	East (m)	Drill Date	Ground Level Elevation (ft)	Total Depth (ft)	Type
Not available	Not available	02/05	Not available	128	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded Steel	1.0	11 3/4	10 3/4	1/2	1.0	128.0

Borehole Notes:

The logging engineer measured the casing diameter using a steel tape. Measurements were rounded to the nearest 1/16 in.

Logging Equipment Information:

Logging System: Gamma 4E	Type: SGLS (70%) SN: 34TP40587A
Calibration Date: 05/04	Calibration Reference: DOE-EM/GJ692-2004
Logging Procedure: MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat			
Date	02/08/05	02/08/05			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	124.0	30.0			
Finish Depth (ft)	0.0	15.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
ft/min	N/A ²	N/A			
Pre-Verification	DE641CAB	DE641CAB			
Start File	DE641000	DE641125			
Finish File	DE641124	DE641140			
Post-Verification	DE641CAA	DE641CAA			
Depth Return Error (in.)	- 1	0			

Log Run	1	2 Repeat			
Comments	No fine gain adjustment.	No fine gain adjustment.			

Logging Operation Notes:

Logging was conducted with a centralizer on the sonde. Logging data acquisition is referenced to the ground surface. A repeat section was acquired to evaluate system performance. The borehole was swabbed before logging, and no contamination was detected by the Radiological Control Technician (RCT).

Analysis Notes:

Analyst:	Henwood	Date:	03/22/05	Reference:	GJO-HGLP 1.6.3, Rev. 0
-----------------	---------	--------------	----------	-------------------	------------------------

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

A casing correction for 0.5-in.-thick casing was applied to the log data.

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 template identified as G4EJul04.xls using efficiency functions and corrections for casing, water, and dead time as determined from annual calibrations. Corrections for dead time are applied where the dead time exceeds 4.7 percent. No correction for water was necessary.

Log Plot Notes:

Separate log plots are provided for the man-made radionuclides (^{137}Cs , ^{60}Co , ^{154}Eu , and ^{152}Eu) detected in the borehole, naturally occurring radionuclides (^{40}K , ^{238}U , ^{232}Th [KUT]), a combination of man-made, KUT, and dead time, and total gamma plotted with dead time. For each radionuclide, the energy value of the spectral peak used for quantification is indicated. Unless otherwise noted, all radionuclides are plotted in picocuries per gram (pCi/g). The open circles indicate the minimum detectable level (MDL) for each radionuclide. Error bars on each plot represent error associated with counting statistics only and do not include errors associated with the inverse efficiency function, dead time correction, casing corrections, or water corrections. Repeat log sections for natural and man-made radionuclides are also included.

Results and Interpretations:

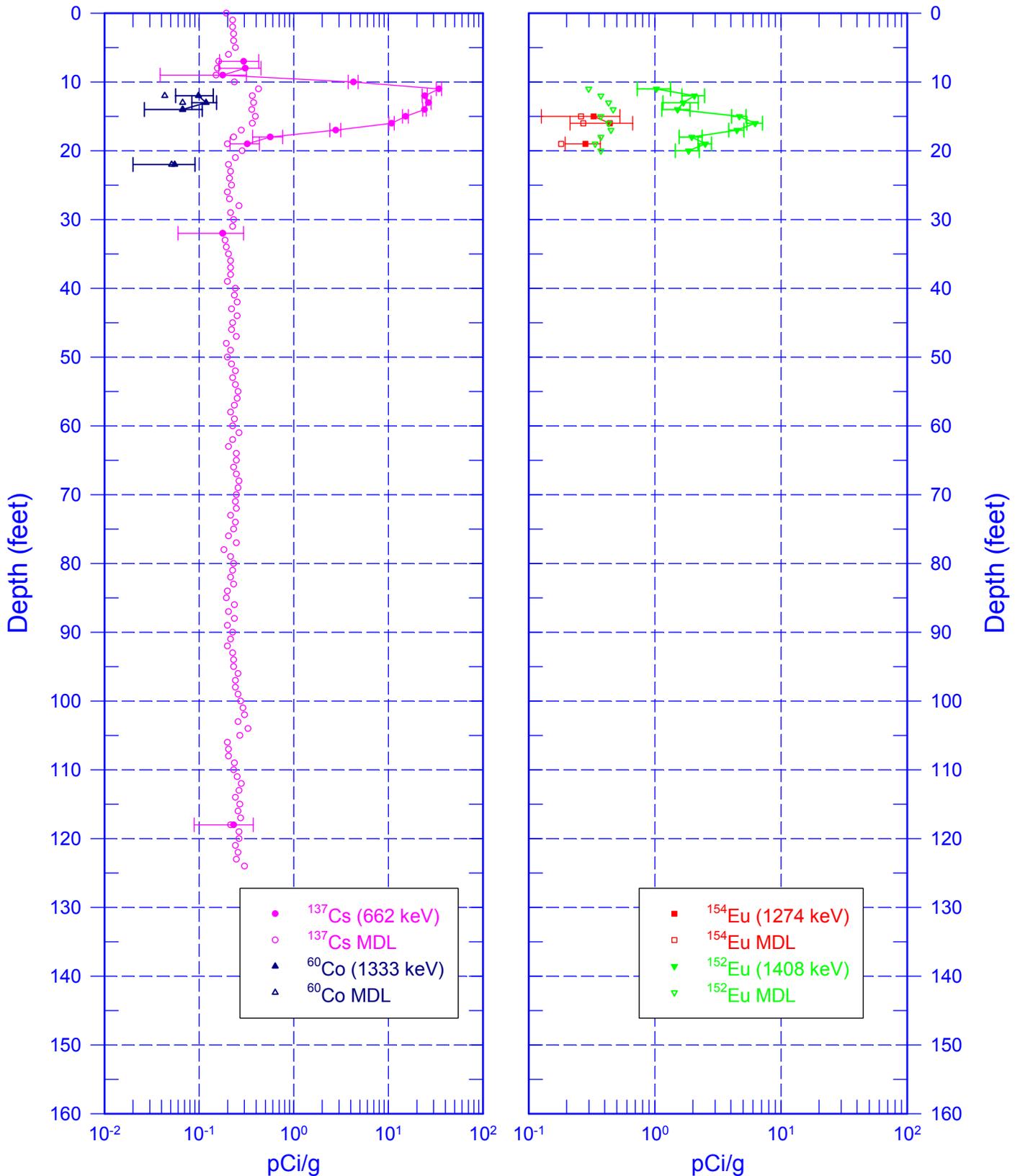
^{137}Cs was detected between 6 and 20 ft and at a few locations near the MDL of 0.2 pCi/g. The maximum concentration was measured at approximately 27 pCi/g at 13 ft. ^{60}Co was detected between 11 and 13 ft and at 22 ft at approximately 0.1 pCi/g. ^{154}Eu was detected intermittently between 14 and 20 ft at approximately 0.4 pCi/g. ^{152}Eu was detected between 10 and 21 ft. A maximum concentration of 6 pCi/g was measured at 16 ft. The repeat sections indicate good agreement of the naturally occurring and man-made radionuclides.

¹ GWL – groundwater level

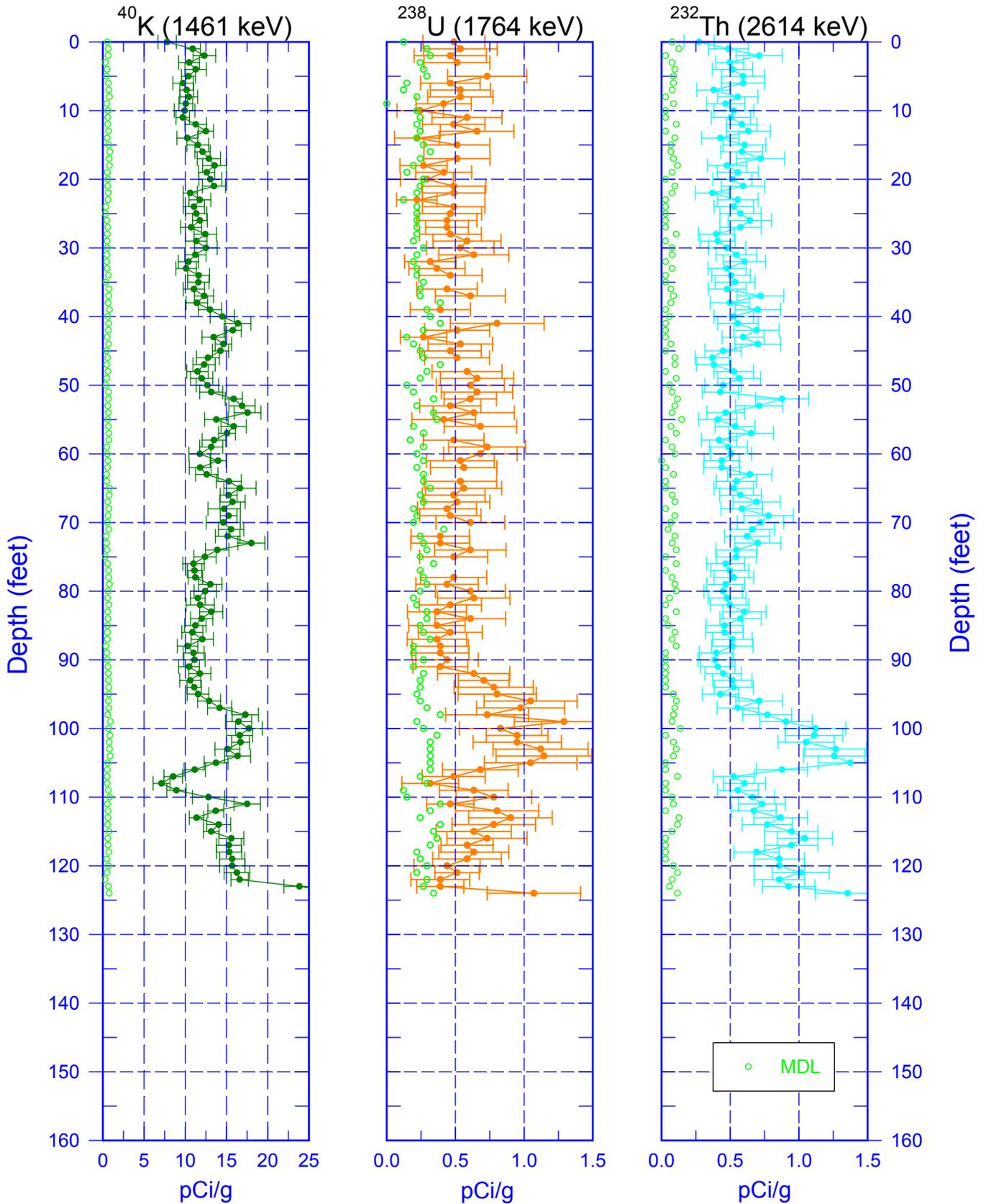
² N/A – not applicable

C4738

Man-Made Radionuclides



C4738 Natural Gamma Logs

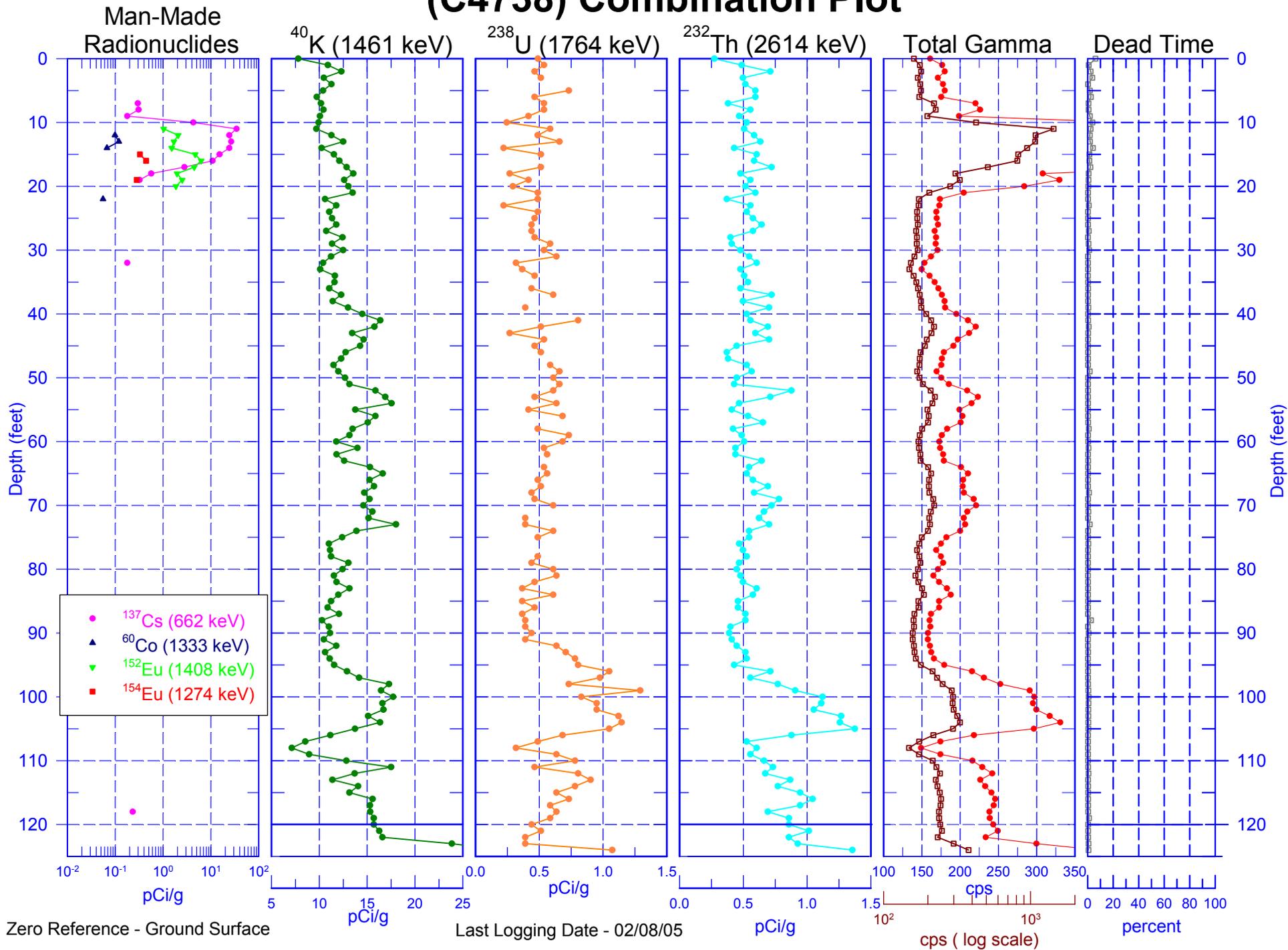


Zero Reference = Ground Surface

Depth Scale: 1" = 20 ft

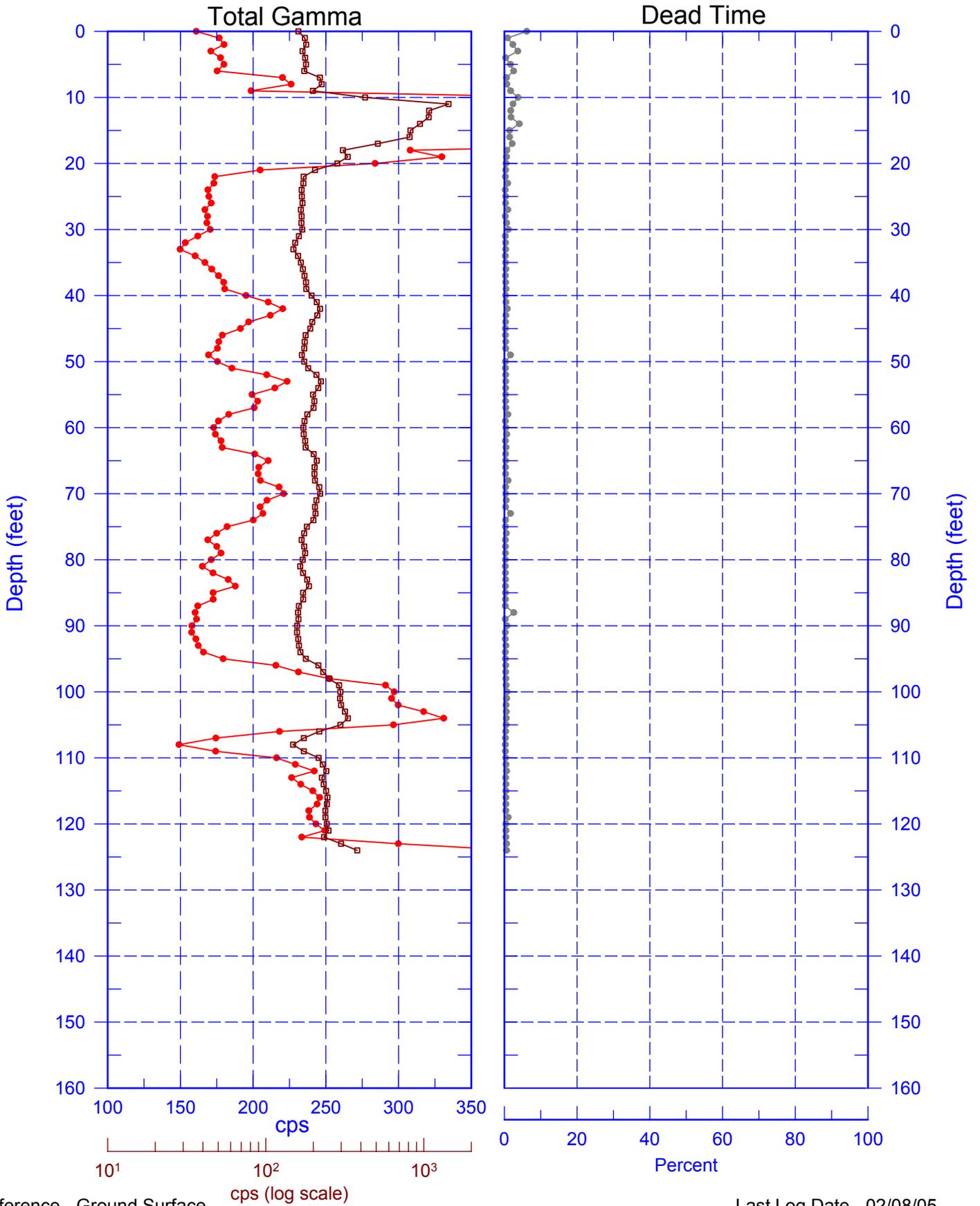
Last Log Date - 02/08/05

(C4738) Combination Plot



C4738

Total Gamma & Dead Time



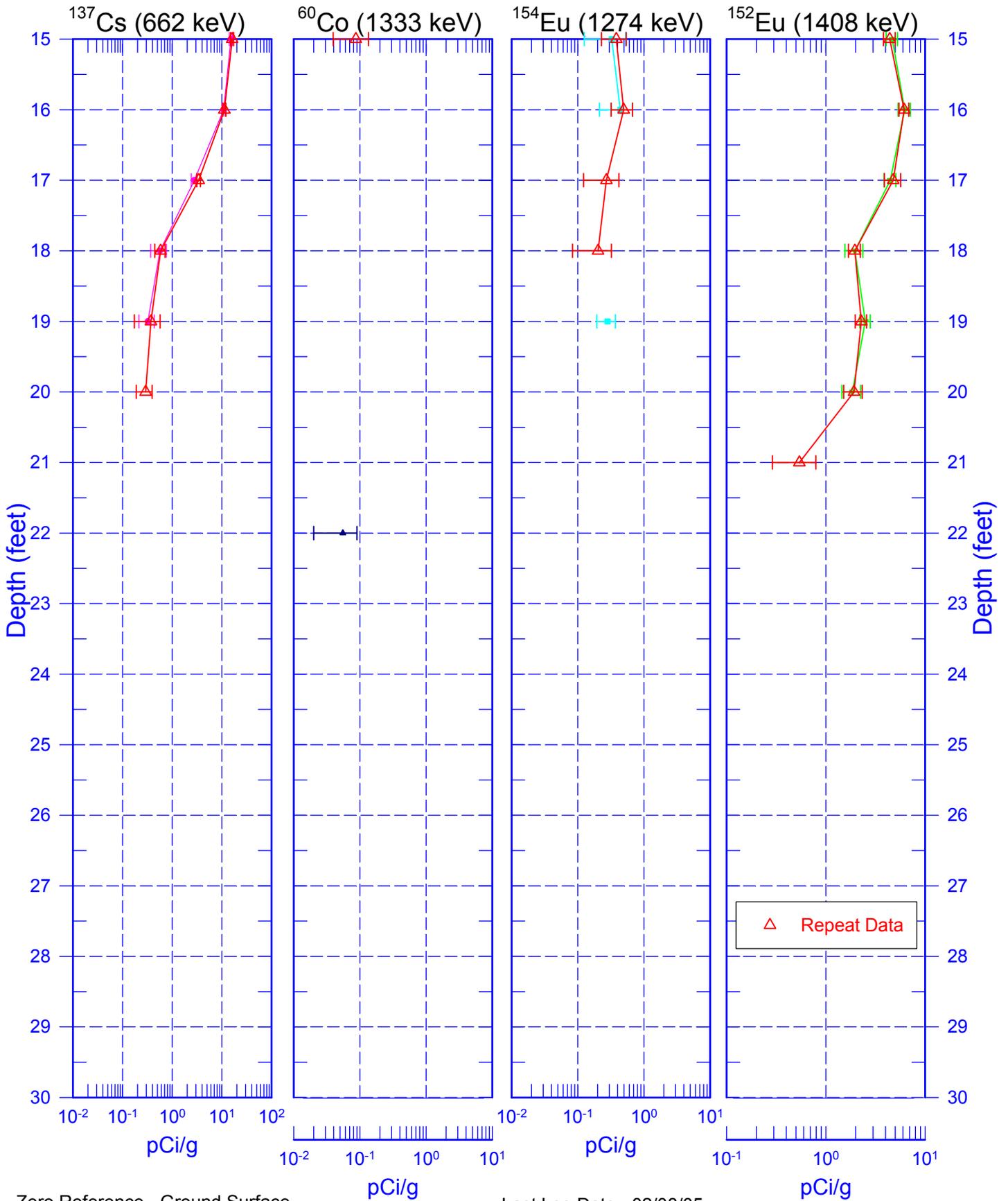
Reference - Ground Surface

cps (log scale)

Last Log Date - 02/08/05

C4738

Man-Made Repeat (15-30 ft)

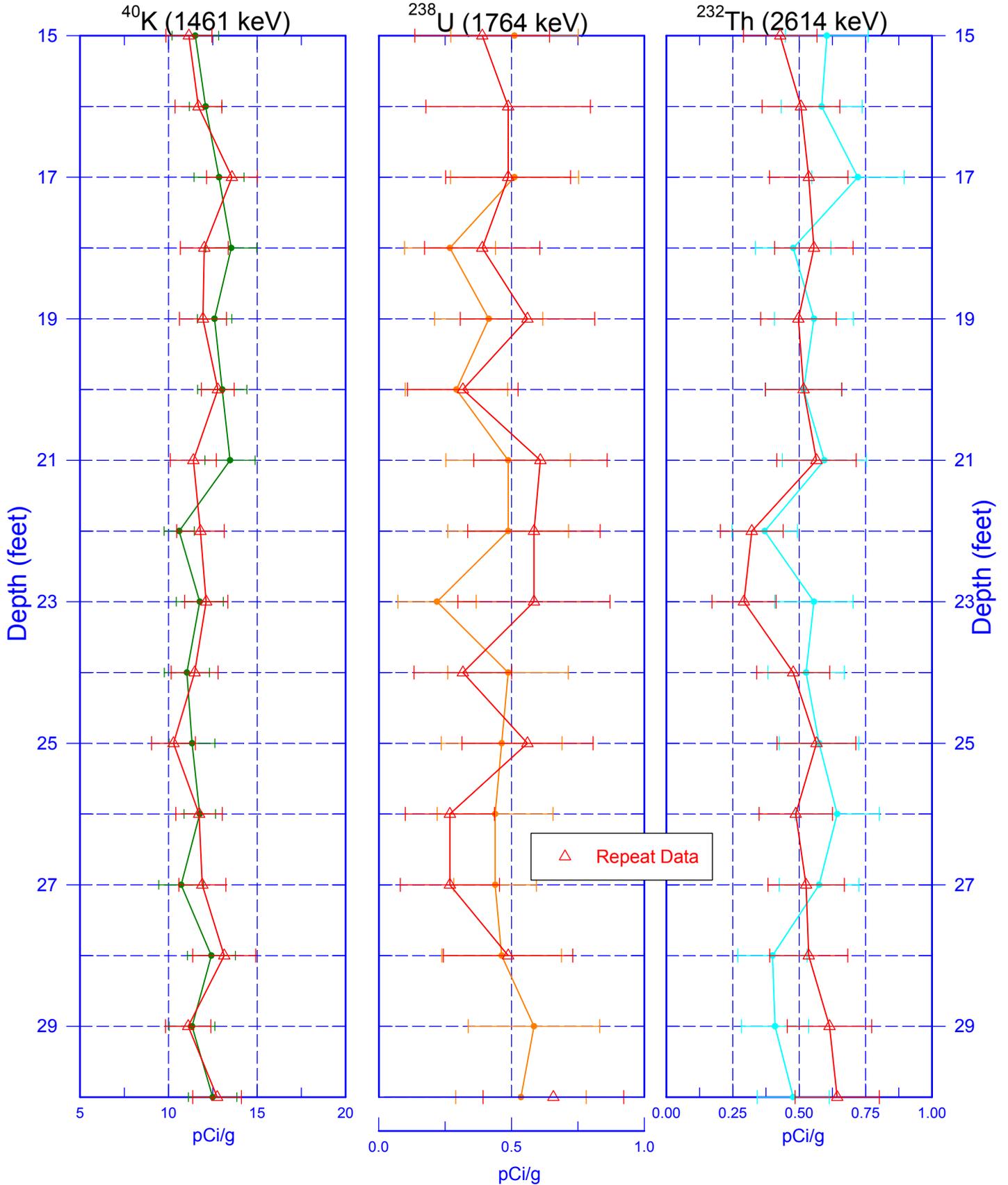


Zero Reference - Ground Surface

Last Log Date - 02/08/05

C4738

Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Last Log Date - 02/08/05