Stoller
Hanford Office

DOE-EM/GJ781-2005

299-E13-55 (A5870)
Log Data Report

Borehole Information:

Borehole: 299-E13-55 (A5870)			**Site:** 216-B-23 Trench		
Coordinates (WA St Plane)		**GWL[1] (ft) :** None		**GWL Date:**	None
North (m)	**East (m)**	**Drill Date**	**Ground Level Elevation (ft)**	**Total Depth (ft)**	**Type**
134242.766	573287.824	08/82	743.02	50	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded Steel	2.4	8 5/8	8	5/16	2.4	50

Borehole Notes:

The logging engineer measured the 8-in. casing and stickup using a steel tape. Measurements were rounded to the nearest 1/16 in. Casing depths are derived from *Hanford Wells* (Chamness and Merz 1993) that also reports grout in the annular space outside the 8-in. casing.

Logging Equipment Information:

Logging System:	Gamma 1E		**Type:**	SGLS (70%) SN: 34TP40587A
Calibration Date:	10/04	**Calibration Reference:**	DOE-EM/GJ713-2004	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	**1**	**2 Repeat**			
Date	11/22/04	11/22/04			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	46.0	44.0			
Finish Depth (ft)	3.0	37.0			
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	AE027CAB	AE027CAB			
Start File	AE028000	AE028044			
Finish File	AE028043	AE028051			
Post-Verification	AE028CAA	AE028CAA			

Log Run	1	2 Repeat			
Depth Return Error (in.)	0	0			
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 top of casing. A repeat section was collected in this borehole to evaluate system performance. Before logging, the borehole was swabbed and no contamination was detected.

Analysis Notes:

Analyst:	Henwood	Date:	01/05/05	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. The energy peak at 2615 keV was approximately 15 percent lower at the end of the day.

A casing correction for 0.3125-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 an EXCEL worksheet template identified as G1EOct04.xls using efficiency functions and corrections for casing, water, and dead time as determined from annual calibrations. No corrections for dead time or water were necessary.

Log Plot Notes:

Separate log plots are provided for the man-made radionuclide (^{137}Cs) 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 man-made and natural radionuclides are also included.

Results and Interpretations:

^{137}Cs and ^{60}Co were the man-made radionuclides detected in this borehole. ^{137}Cs was detected between the ground surface and 8 ft; the maximum concentration was measured at approximately 1 pCi/g at 6 ft.

^{60}Co was detected between 37 and 46 ft and at a few locations between 16 and 26 ft. The maximum concentration was measured at 0.4 pCi/g at 39 ft.

The repeat sections generally indicate good agreement of the man-made and naturally occurring radionuclides.

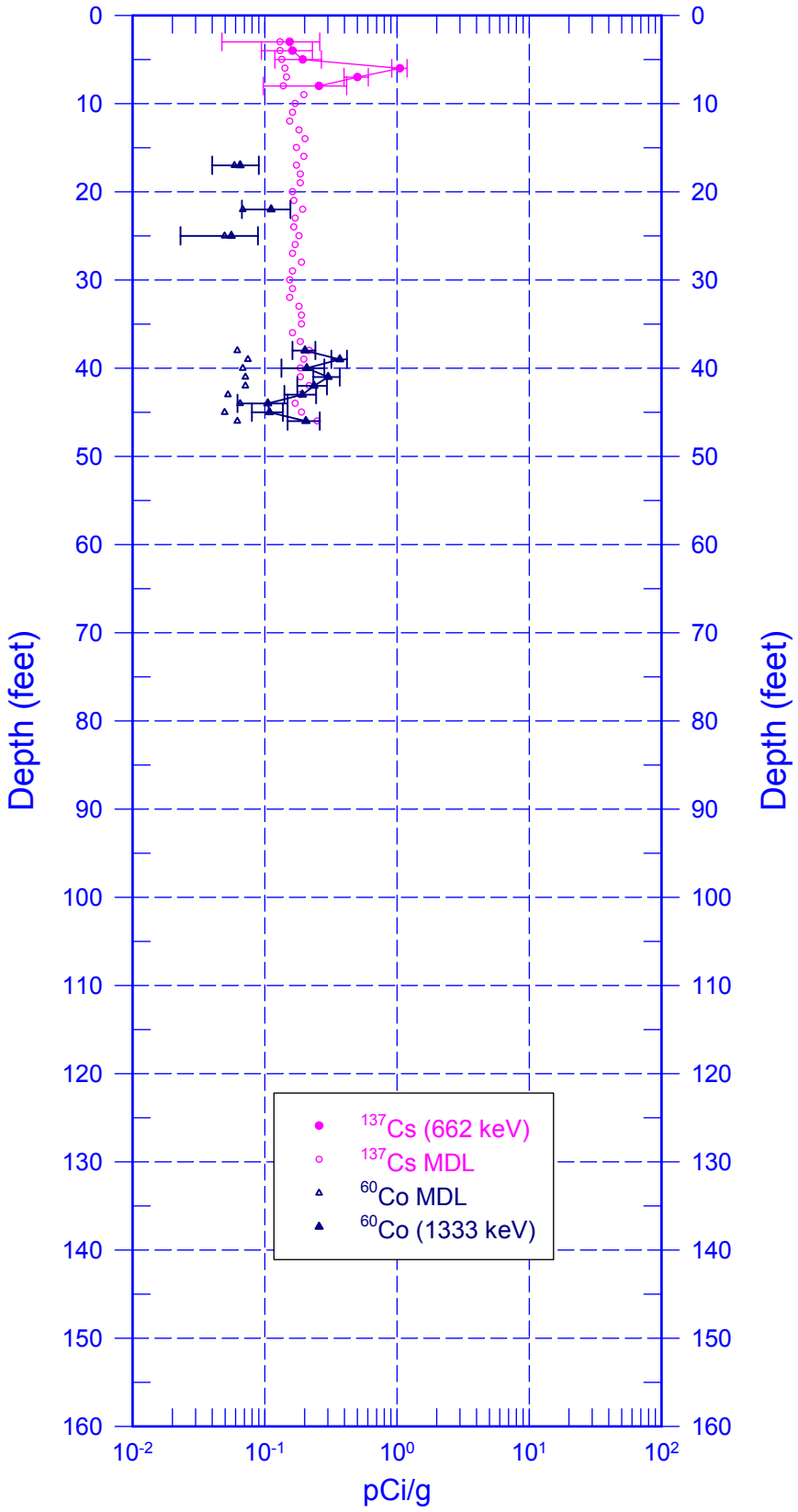
References:

Chamness, M.A., and J.K. Merz, 1993. *Hanford Wells*, PNL-8800, Pacific Northwest Laboratory, Richland, Washington.

Ledgerwood, R.K., 1993. *Summaries of Well Construction Data and Field Observations for Existing 200-East Resource Protection Wells*, WHC-SD-ER-TI-007, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

[1] GWL – groundwater level
[2] N/A – not applicable

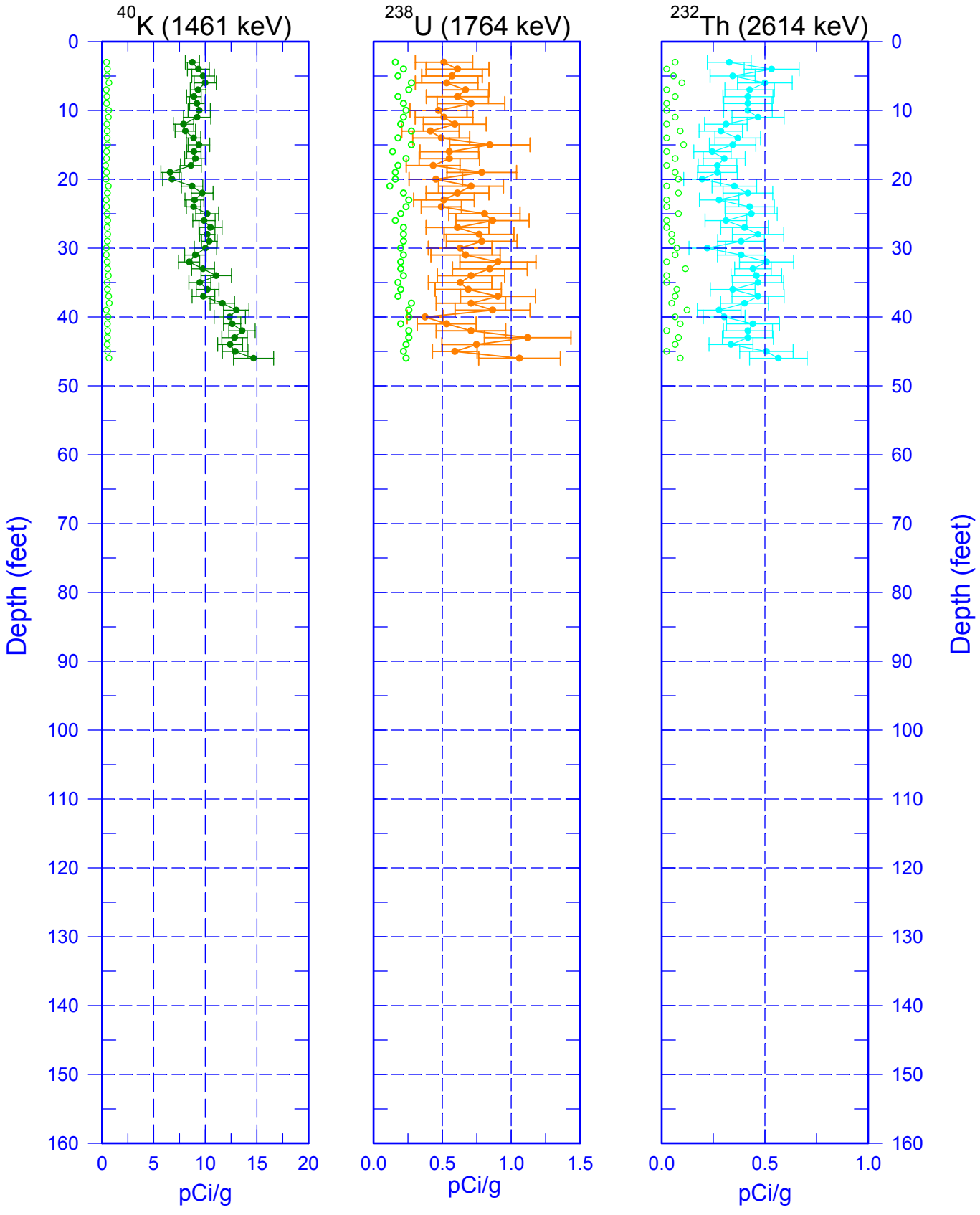
299-E13-55 (A5870)
Man-Made Radionuclides



Zero Reference - Top of Casing

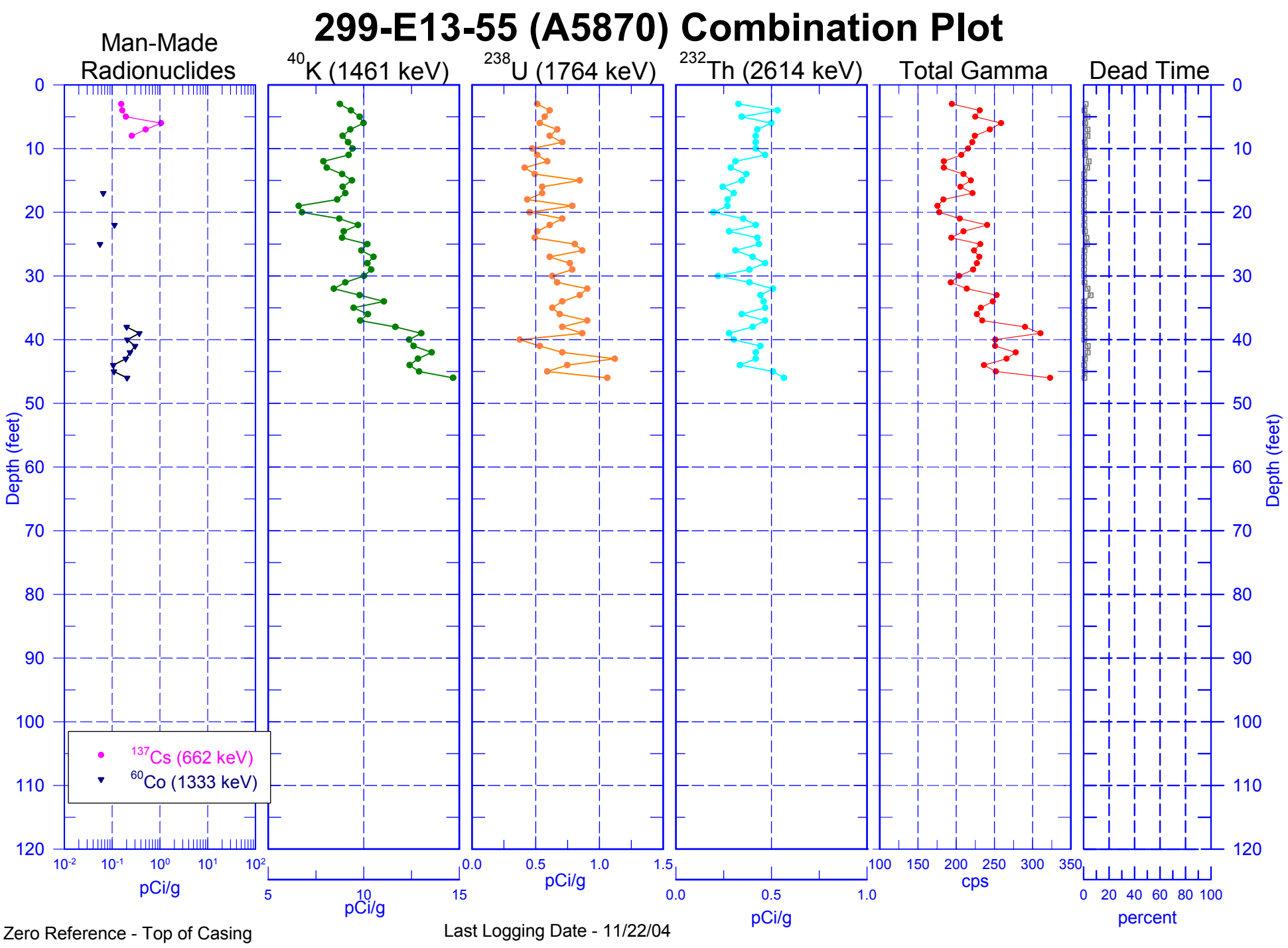
Last Log Date - 11/22/04

299-E13-55 (A5870)
Natural Gamma Logs

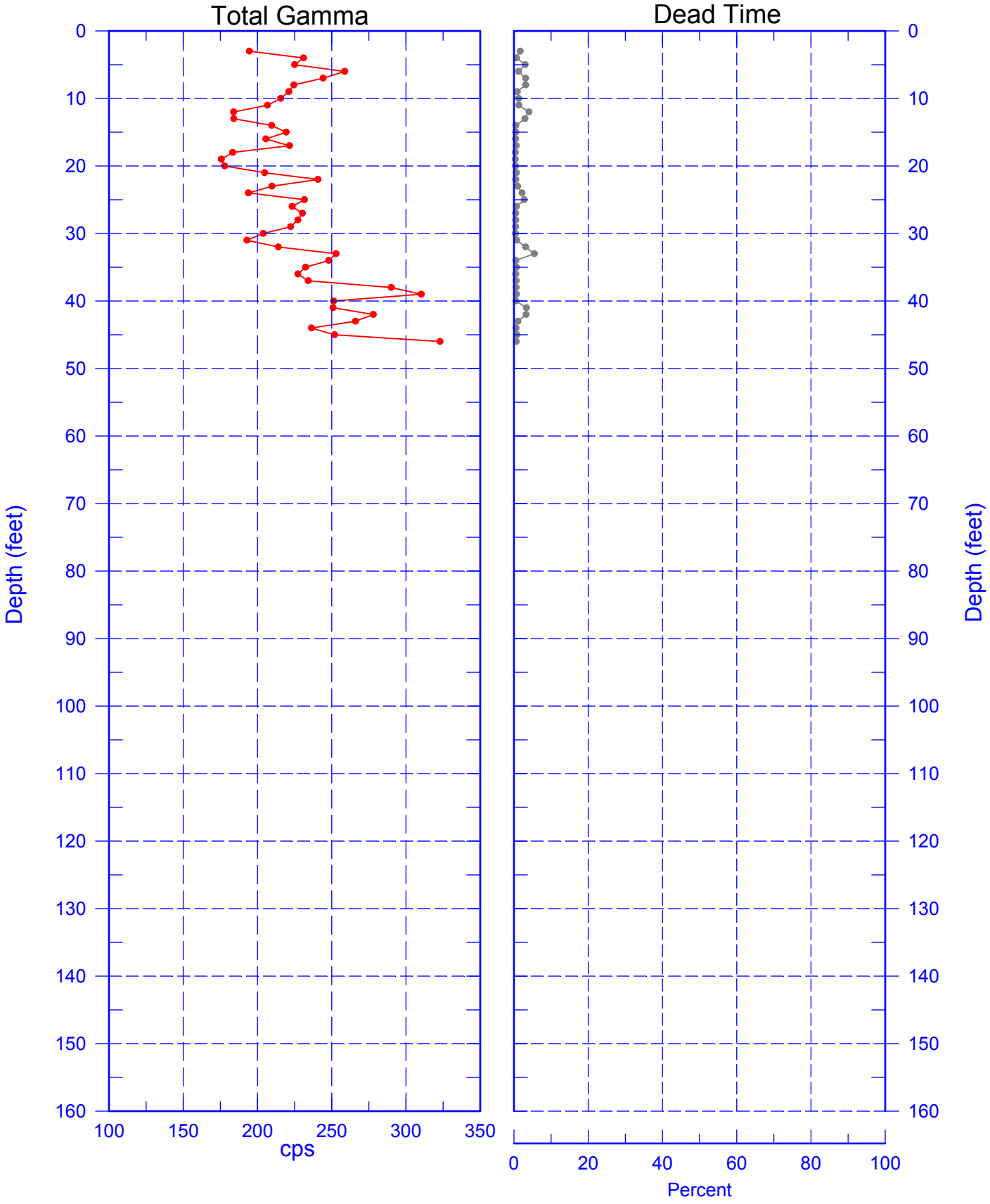


Zero Reference = Top of Casing

Last Log Date - 11/22/04


299-E13-55 (A5870) Combination Plot
Man-Made Radionuclides
40K (1461 keV)
238U (1764 keV)
232Th (2614 keV)
Total Gamma
Dead Time
Depth (feet)
137Cs (662 keV)
60Co (1333 keV)
pCi/g
cps
percent
Zero Reference - Top of Casing
Last Logging Date - 11/22/04

299-E13-55 (A5870)
Total Gamma & Dead Time

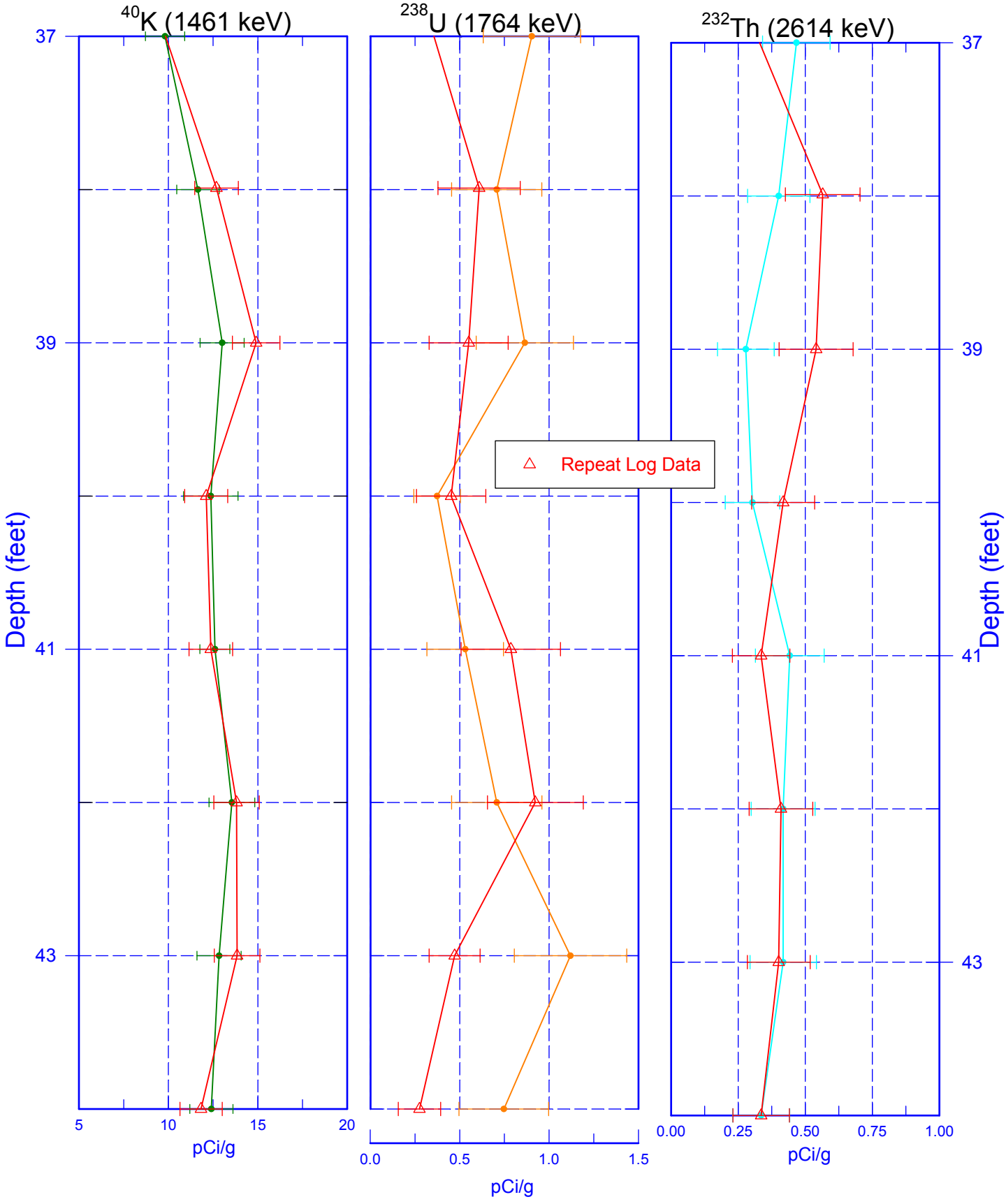


Reference - Top of Casing

Last Log Date - 11/22/04

299-E13-55 (A5870)

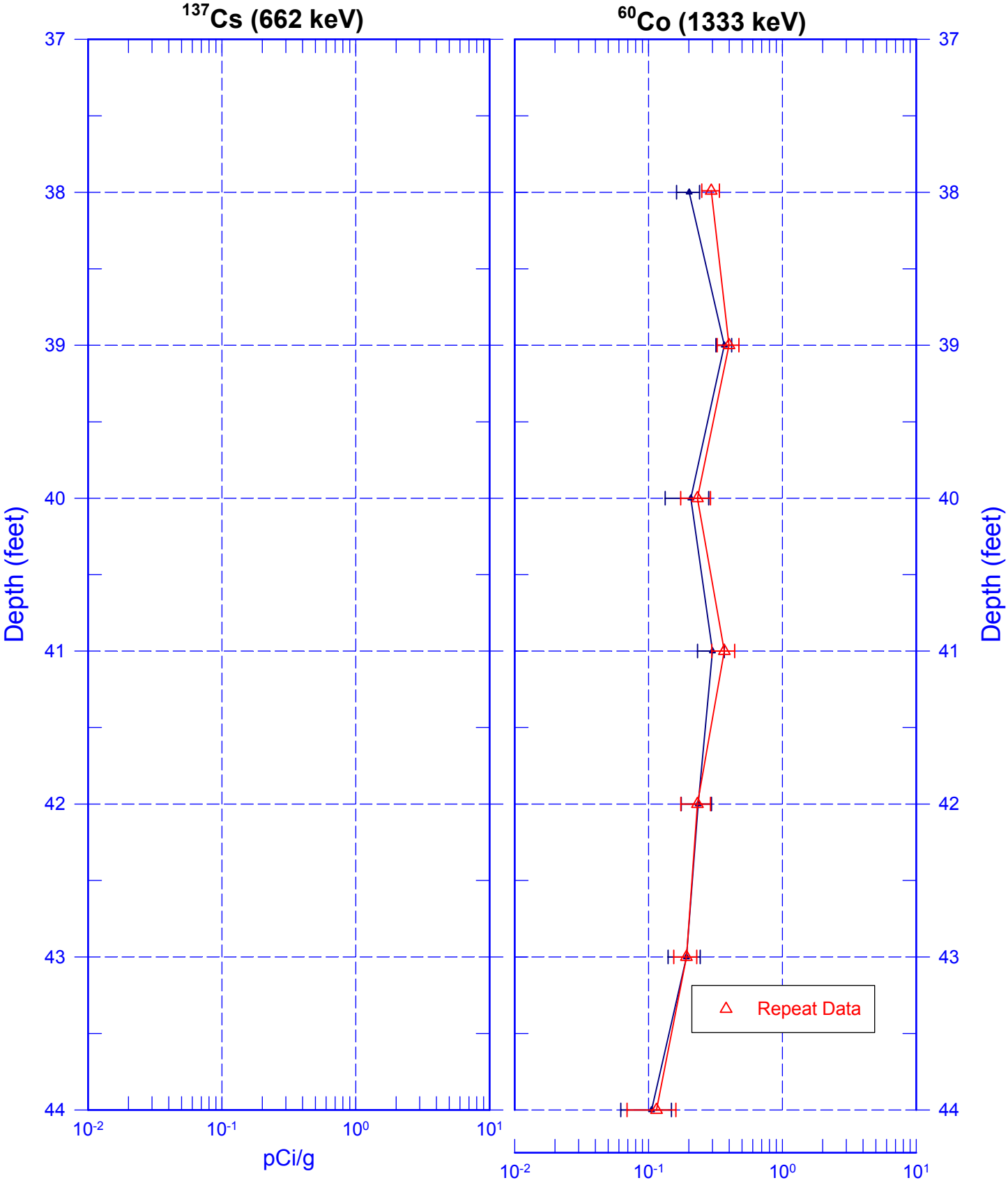
Repeat Section of Natural Gamma Logs



Zero Reference - Top of Casing

Last Log Date - 11/22/04

299-E13-55 (A5870)
Manmade Repeat (37-44 ft)



Zero Reference - Top of Casing

Last Log Date - 11/22/04