

## 299-E28-53 (A6804) Log Data Report

### Borehole Information:

<b>Borehole:</b> 299-E28-53 (A6804)		<b>Site:</b> 216-B-9 Crib			
<b>Coordinates (WA St Plane)</b>		<b>GWL<sup>1</sup> (ft):</b> n/a <sup>2</sup>		<b>GWL Date:</b> n/a	
<b>North (m)</b> 136814	<b>East (m)</b> 573855	<b>Drill Date</b> 07/48	<b>TOC<sup>3</sup> Elevation (ft)</b> 686.32	<b>Total Depth (ft)</b> 152	<b>Type</b> cable tool

### Casing Information:

<b>Casing Type</b>	<b>Stickup (ft)</b>	<b>Outer Diameter (in.)</b>	<b>Inside Diameter (in.)</b>	<b>Thickness (in.)</b>	<b>Top (ft)</b>	<b>Bottom (ft)</b>
Steel (welded)	2.3	8.625	8	0.322	0	25

### Borehole Notes:

The drilling depth, casing depth, and date of drilling are derived from *Hanford Wells* (Chamness and Merz 1993). The reason for the difference between the drilled depth (152 ft) and reported completion depth (25 ft) is unknown. The casing size information for the 8-in. steel casing is confirmed from tape and caliper measurements collected in the field by Stoller personnel. The coordinates and TOC elevation are derived from HWIS<sup>4</sup>.

### Logging Equipment Information:

<b>Logging System:</b> Gamma 2A	<b>Type:</b> SGLS (35%)
<b>Calibration Date:</b> 11/01	<b>Calibration Reference:</b> GJO-2002-286-TAR
<b>Logging Procedure:</b> MAC-HGLP 1.6.5, Rev. 0	

<b>Logging System:</b> Gamma 1C	<b>Type:</b> HRLS
<b>Calibration Date:</b> 02/02	<b>Calibration Reference:</b> GJO-2002-309-TAR
<b>Logging Procedure:</b> MAC-HGLP 1.6.5, Rev. 0	

### Spectral Gamma Logging System (SGLS) Log Run Information:

<b>Log Run</b>	<b>1</b>	<b>2</b>	<b>3</b>		
Date	03/18/02	03/19/02	03/19/02		
Logging Engineer	Spatz	Spatz	Spatz		
Start Depth (ft)	2.5	25.5	14.5		
Finish Depth (ft)	14.5	15.0	7.0		
Count Time (sec)	100	100	100		
Live/Real	R	R	R		
Shield (Y/N)	N	N	N		
MSA Interval (ft)	0.5	0.5	0.5		
ft/min	n/a	n/a	n/a		
Pre-Verification	B0102CAB	B0104CAB	B0104CAB		
Start File	B0103000	B0104000	B0104022		

Log Run	1	2	3		
Finish File	B0103024	B0104021	B0104037		
Post-Verification	B0103CAA	B0104CAA	B0104CAA		

### **High Rate Logging System (HRLS) Log Run Information:**

Log Run	1	2	3		
Date	05/14/02				
Logging Engineer	Kos				
Start Depth (ft)	12.0				
Finish Depth (ft)	26.0				
Count Time (sec)	300				
Live/Real	R				
Shield (Y/N)	N				
MSA Interval (ft)	0.5				
ft/min	n/a				
Pre-Verification	AC016CAB				
Start File	AC016000				
Finish File	AC016028				
Post-Verification	AC017CAA				

### **Logging Operation Notes:**

Spectral gamma logging with the SGLS was performed in this borehole during March 2002 in two days; HRLS logging was performed in May 2002. Logging measurements are referenced to the top of the 8-in. casing. A repeat section with the SGLS was collected in this borehole from 7-14.5 ft to measure logging system performance.

### **Analysis Notes:**

<b>Analyst:</b>	Henwood	<b>Date:</b>	07/29/02	<b>Reference:</b>	
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The pre- and post-run verification data met the acceptance criteria established for both the SGLS and HRLS. The post-run verification data files were utilized for the energy and resolution calibration necessary to process the data.

A casing correction for 0.322-in.-thick casing was applied to the log data for the 8-in. steel casing.

Log 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 G2ANOV01.xls and G1CFEB02.xls for the SGLS and HRLS, respectively, using efficiency functions and corrections for casing and dead time determined during calibrations. HRLS data were substituted where SGLS dead time exceeded 40 percent.

### **Log Plot Notes:**

Separate log plots are provided for the man-made radionuclide (<sup>137</sup>Cs) detected in the borehole, naturally occurring radionuclides (<sup>40</sup>K, <sup>238</sup>U, <sup>232</sup>Th [KUT]), a combination of man-made, KUT, total gamma and dead time, and a repeat section. 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, or casing corrections.

## **Results and Interpretations:**

<sup>137</sup>Cs was the only man-made radionuclide detected in this borehole. Significant <sup>137</sup>Cs concentrations were measured between 2.5 and 25.5 ft in depth. The maximum <sup>137</sup>Cs concentration measured was about 84,000 pCi/g at 20 ft in depth. At the total depth of the borehole the concentration is 65,000 pCi/g, indicating the contamination has not been completely penetrated by the borehole.

The repeat log data section acquired from the 7- to 14.5-ft depth interval shows good repeatability of logging depth and concentration calculations. Below 13 ft, high dead times occurred and no KUT data are available.

## **References:**

Chamness, M.A., and J.K. Merz, 1993. *Hanford Wells*, PNNL-8800, UC-903, Pacific Northwest Laboratory, Richland, Washington.

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<sup>1</sup> GWL – groundwater level

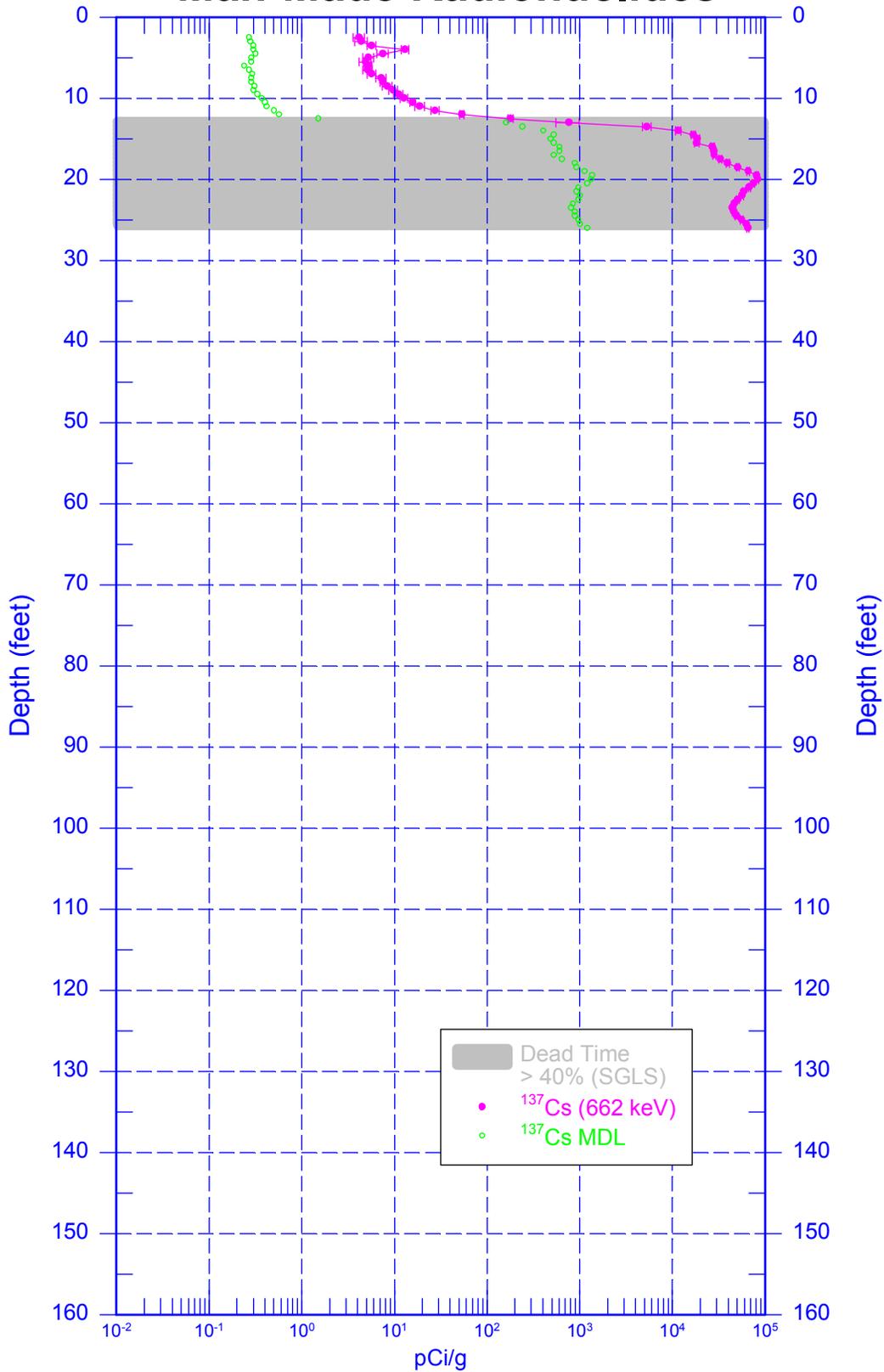
<sup>2</sup> n/a – not applicable

<sup>3</sup> TOC – top of casing

<sup>4</sup> HWIS – Hanford Well Information System

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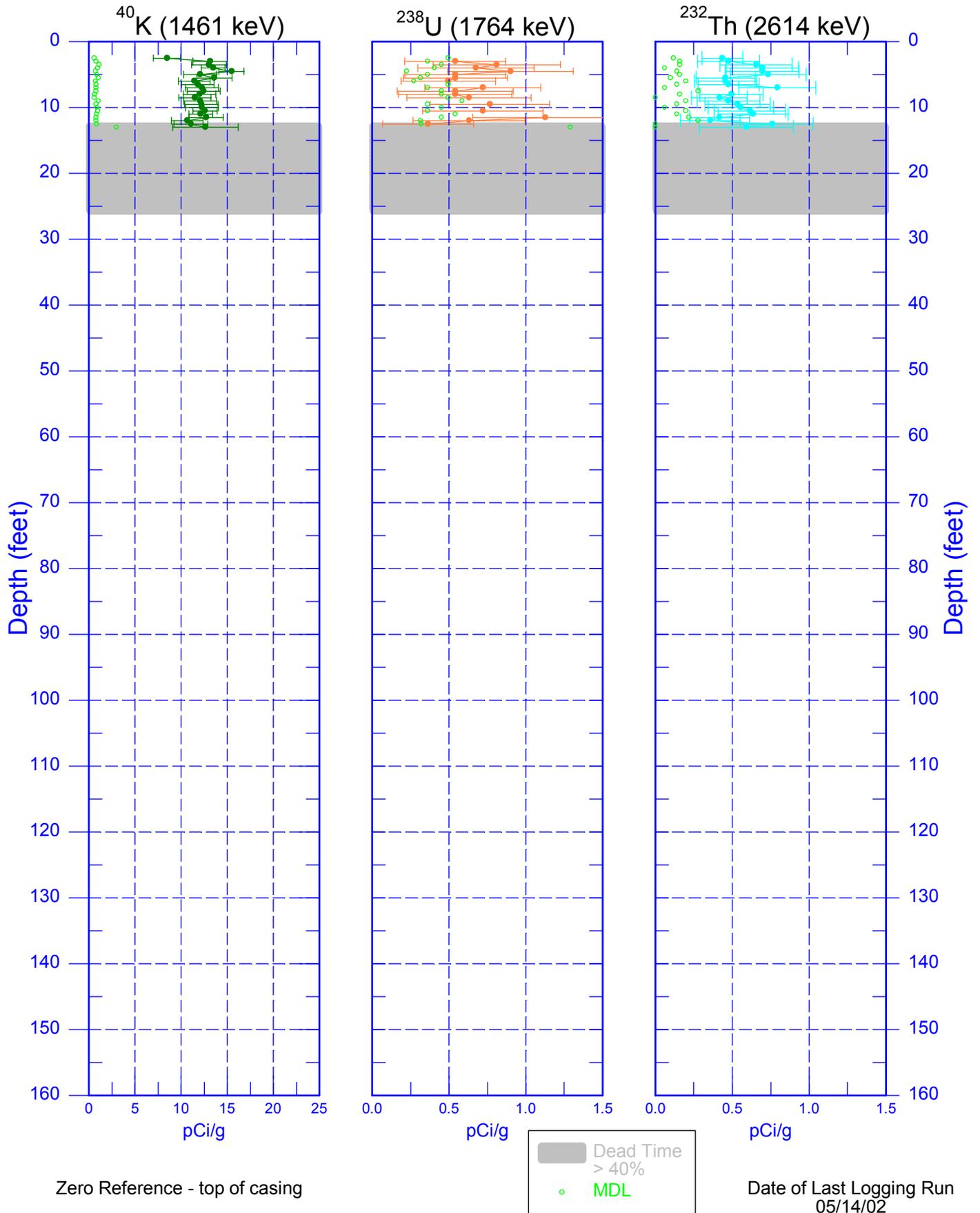
## Man-Made Radionuclides



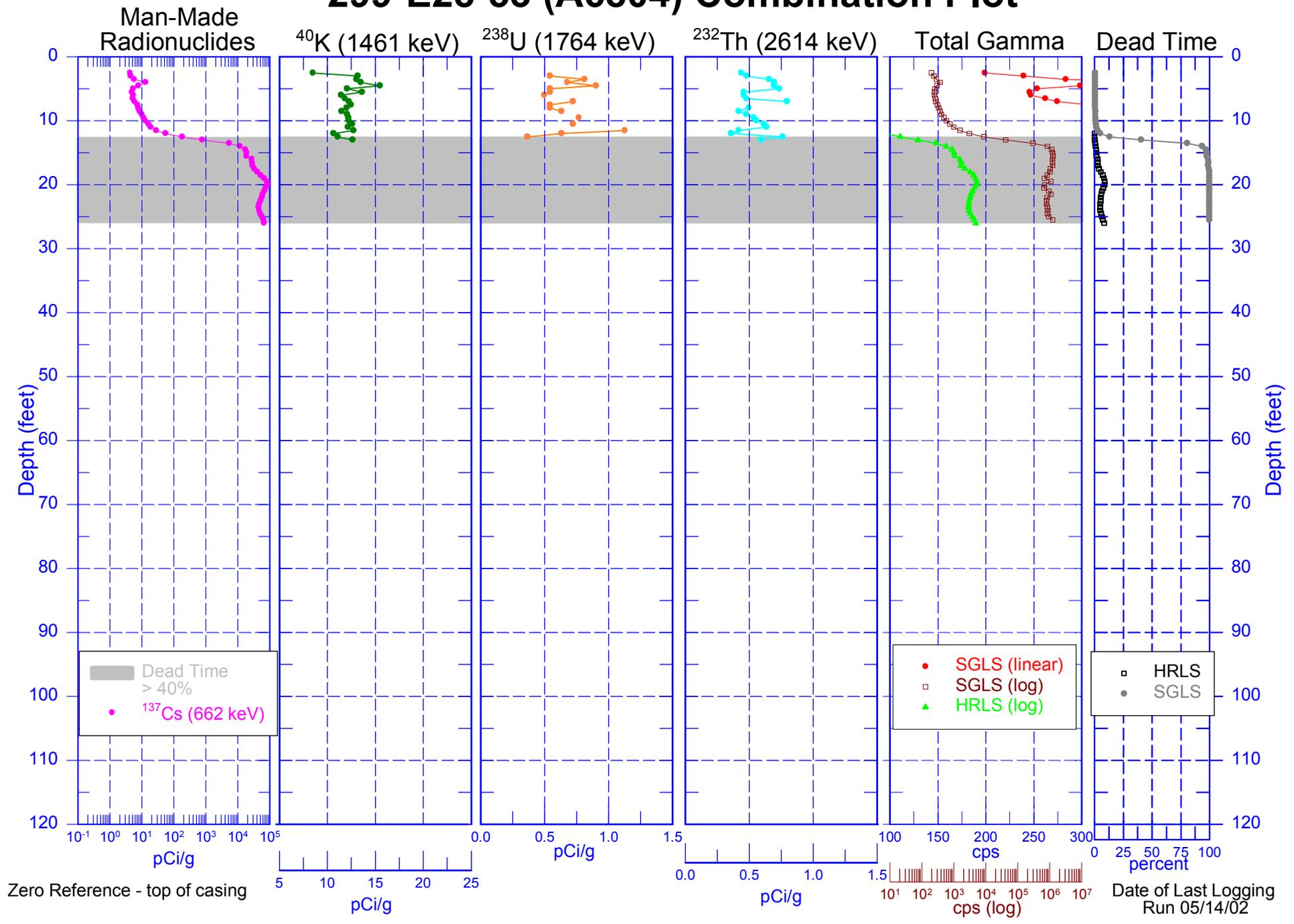
Zero Reference - Top of Casing

Date of Last Logging Run  
05/14/02

# 299-E28-53 (A6804) Natural Gamma Logs



# 299-E28-53 (A6804) Combination Plot



# 299-E28-53 (A6804) Repeat Log Section

