

299-E28-76 (A6827) Log Data Report

Borehole Information:

Borehole: 299-E28-76 (A6827)		Site: 216-B-12	
Coordinates (WA St Plane)		GWL¹ (ft): None	GWL Date: 01/30/08
North (m)	East (m)	Drill Date	TOC Elevation
Not available	Not available	07/82	Not available
		Total Depth (ft)	Type
		102	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded steel	0	8 5/8	8	5/16	0	102

Borehole Notes:

The logging engineer measured the casing diameter with a caliper and steel tape. The top of the borehole casing is located inside a 55-gal. drum that was used to protect the casing when the surface of the crib was buried with approximately 4 ft of earth. The casing stickup is approximately 2 ft high inside the barrel and approximately 1 ft below the new ground surface. The zero reference for the logging measurements is the top of casing.

Logging Equipment Information:

Logging System:	Gamma 1N	Type:	SGLS HpGe (60%)
Effective Calibration Date:	04/05/06	Serial No.:	45TP22010A
	Calibration Reference:	DOE-EM-GJ1183-2006	
	Logging Procedure:	GJO-HGLP 1.6.5, Rev. 1	

Logging System:	Gamma 1C	Type:	HRLS planar HpGe
Effective Calibration Date:	04/05/06	Serial No.:	39A314
	Calibration Reference:	DOE-EM/GJ1019-2005	
	Logging Procedure:	GJO-HGLP 1.6.5, Rev. 1	

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

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2	3	4	5 Repeat
Date	06/06/06	06/06/06	06/06/06	06/06/06	06/07/06
Logging Engineer	Spatz	Spatz	Spatz	Spatz	Spatz
Start Depth (ft)	0.0	37.0	60.0	64.0	67.0
Finish Depth (ft)	37.0	60.0	65.0	101.0	78.0
Count Time (sec)	100	20	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	AN034CAB	AN034CAB	AN034CAB	AN035CAB	AN035CAB
Start File	AN034000	AN034038	AN034062	AN035000	AN035038
Finish File	AN034037	AN034061	AN034067	AN035037	AN035049

HGLP-LDR-198, Rev. 0

Log Run	1	2	3	4	5 Repeat
Post-Verification	AN034CAA	AN034CAA	AN034CAA	AN035CAA	AN035CAA
Depth Return Error (in.)	N/A	N/A	- 1.0	N/A	+ 1.0
Comments	No fine gain adjustment				

Notes: Log run 2 data were acquired at 20 sec count time through an interval where high dead time exists.

High Rate Logging System (HRLS) Log Run Information:

Log Run	6	7 Repeat	8		
Date	06/07/06	06/08/06	06/08/06		
Logging Engineer	Spatz	Spatz	Spatz		
Start Depth (ft)	36.0	37.0	78.0		
Finish Depth (ft)	61.0	47.0	80.0		
Count Time (sec)	300	300	300		
Live/Real	R	R	R		
Shield (Y/N)	N	N	N		
MSA Interval (ft)	1.0	1.0	1.0		
Pre-Verification	AC158CAB	AC159CAB	AC159CAB		
Start File	AC158000	AC159000	AC159011		
Finish File	AC158025	AC159010	AC159013		
Post-Verification	AC158CAA	AC159CAA	AC159CAA		
Depth Return Error (in.)	0	N/A	N/A		
Comments	No fine gain adjustment	No fine gain adjustment	No fine gain adjustment		

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	9	10 Repeat			
Date	01/30/08	01/30/08			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	0.0	25.0			
Finish Depth (ft)	101.75	40.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
Pre-Verification	DHA72CAB	DHA72CAB			
Start File	DHA72000	DHA72408			
Finish File	DHA72407	DHA72468			
Post-Verification	DHA72CAA	DHA72CAA			
Depth Return Error (in.)	N/A	- 1.0			
Comments	None	None			

Logging Operation Notes:

This borehole was logged in June 2006 with the SGLS and HRLS. In January 2008, additional logging with the neutron moisture sonde was conducted. Logging was conducted with a centralizer on the sondes. All measurements are referenced to top of casing.

Analysis Notes:

Analyst:	Henwood	Date:	04/17/08	Reference:	GJO-HGLP 1.6.3, Rev. 0
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Pre- 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 5/16-in. thick casing was applied to the SGLS and HRLS data.

The moisture data are reported in volume percent moisture according to calibrations for an 8-in. borehole.

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 G1NApr06.xls and G1cOct05.xls for the SGLS and HRLS, respectively, using efficiency functions and corrections for casing and dead time as determined from annual calibrations. HRLS data are substituted for SGLS data where dead time exceeds approximately 40 percent.

Results and Interpretations:

Cs-137 was detected almost throughout the borehole. The maximum concentration was measured at approximately 7800 pCi/g at 39 ft.

Moisture data indicate some variability. A well summary created by Rockwell (date and specific reference unknown) reported 90 gal. of grout was emplaced around the 8-in. casing from 0 to 20 ft and a grout plug (9 gal.) at the bottom of the borehole from 100 to 102 ft. The moisture log suggests possible grout from 3 to 5 ft and from 25 to 35 ft. The data from 5 to 25 ft suggests little, if any; grout was introduced around the casing. The moisture data suggests fine-grained sediment intervals at approximately 60 and 79 ft.

Repeat sections acquired for each logging system indicate good repeatability.

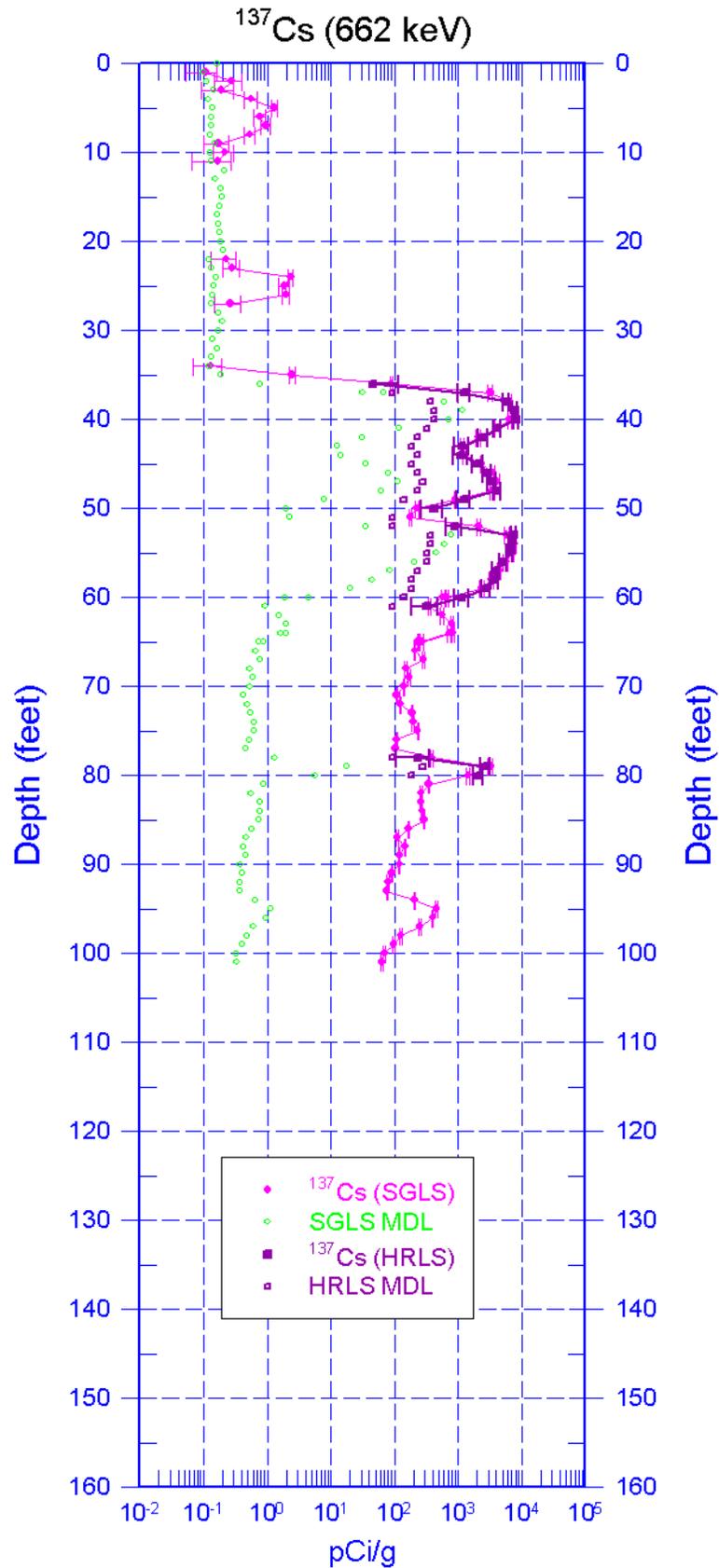
List of Log Plots:

Depth reference is top of casing

Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Moisture
Total Gamma & Dead Time
Repeat of Manmade Radionuclides
Repeat Section of Natural Gamma Logs
Repeat of Moisture

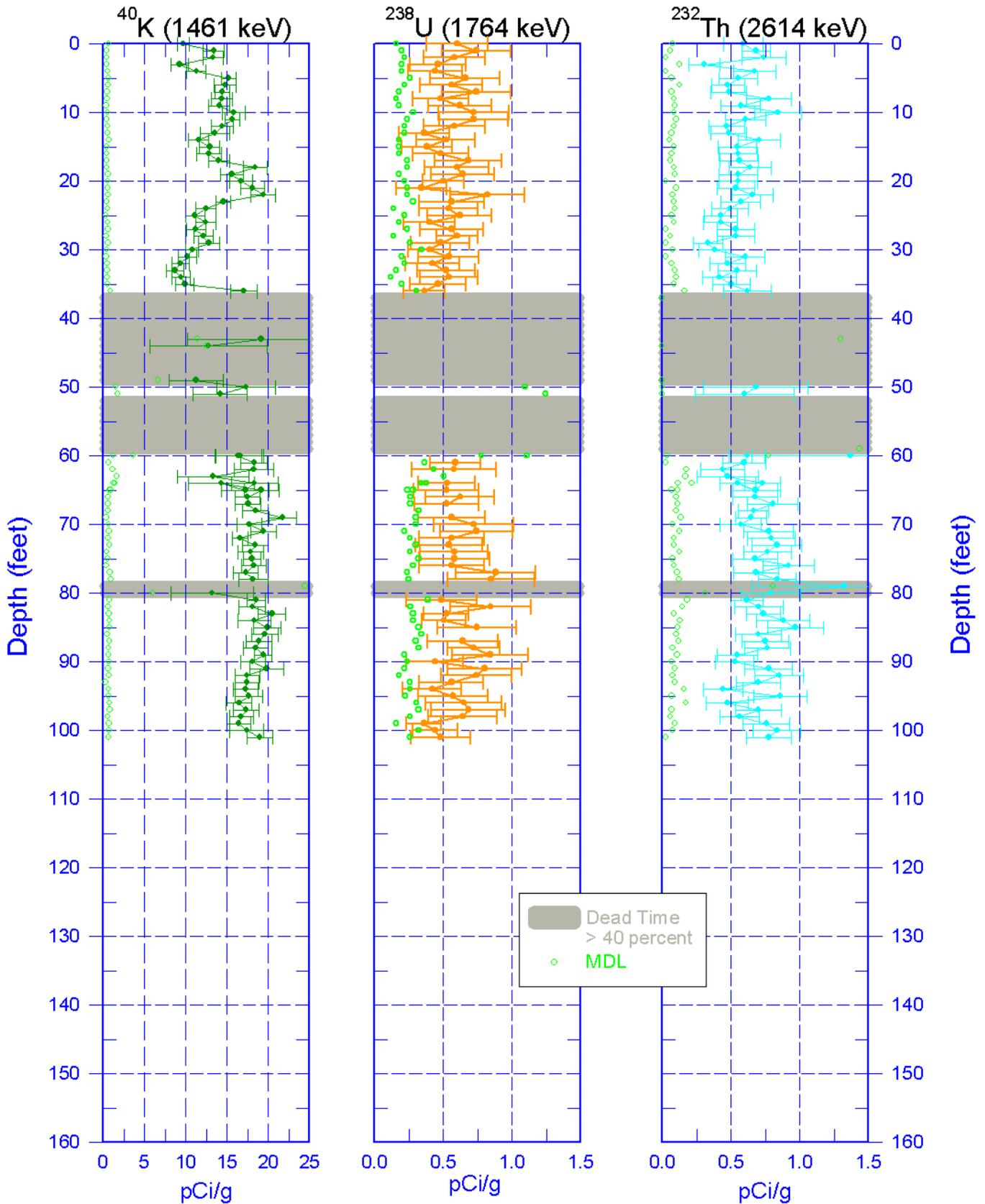
¹ GWL – groundwater level

299-E28-76 (A6827) Manmade Radionuclides



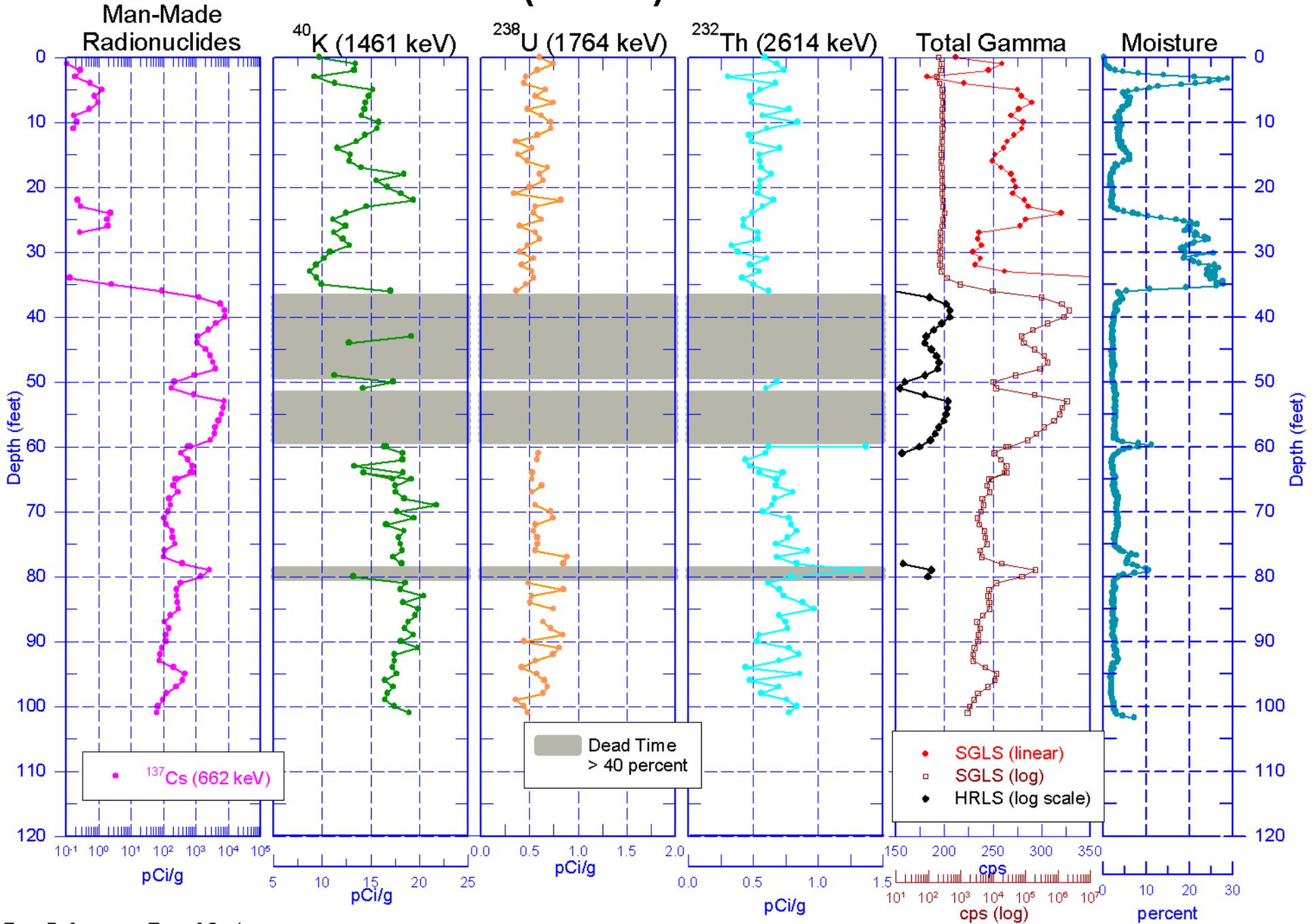
Zero Reference = Top of Casing

299-E28-76 (A6827) Natural Gamma Logs



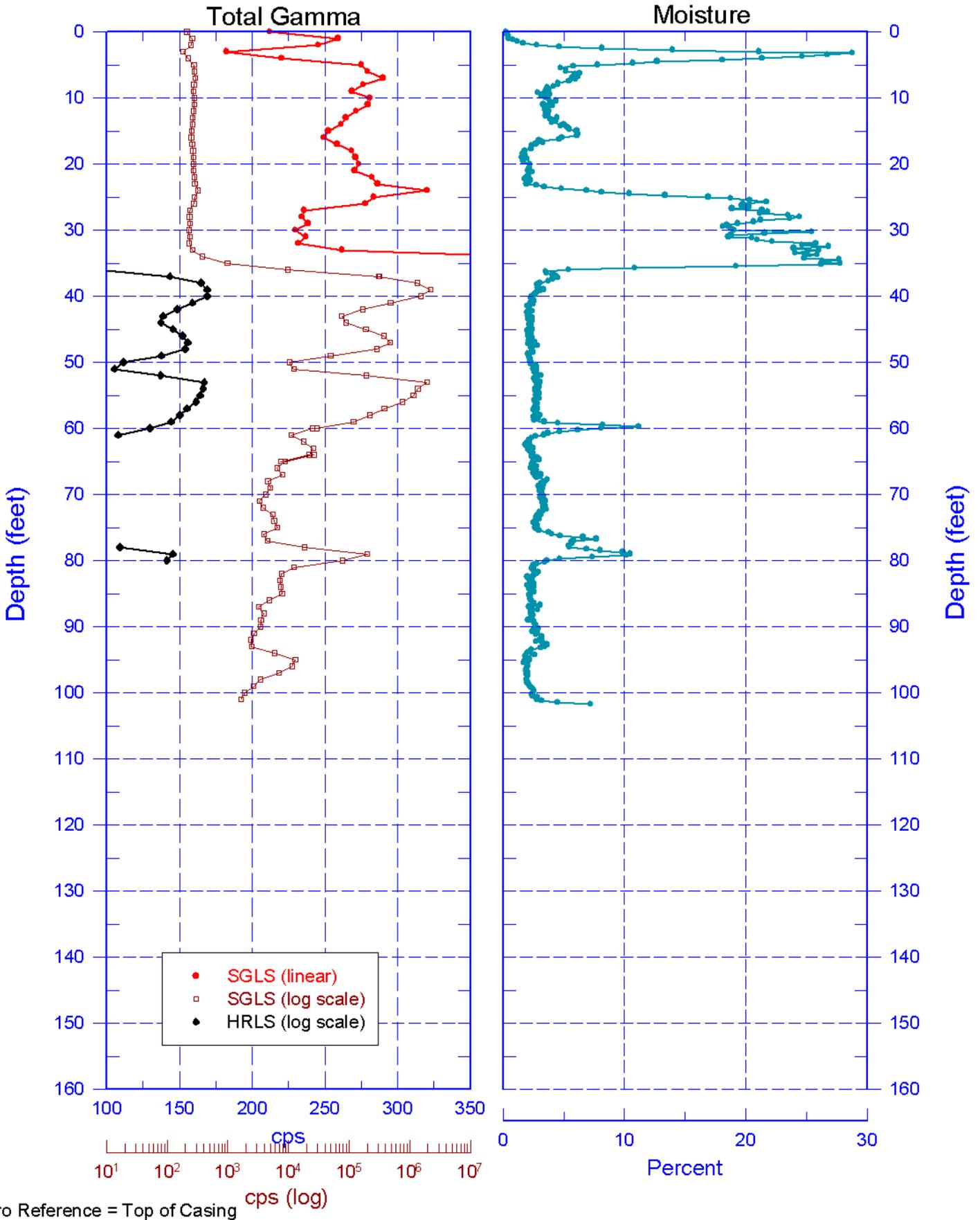
Zero Reference = Top of Casing

299-E28-76 (A6827) Combination Plot

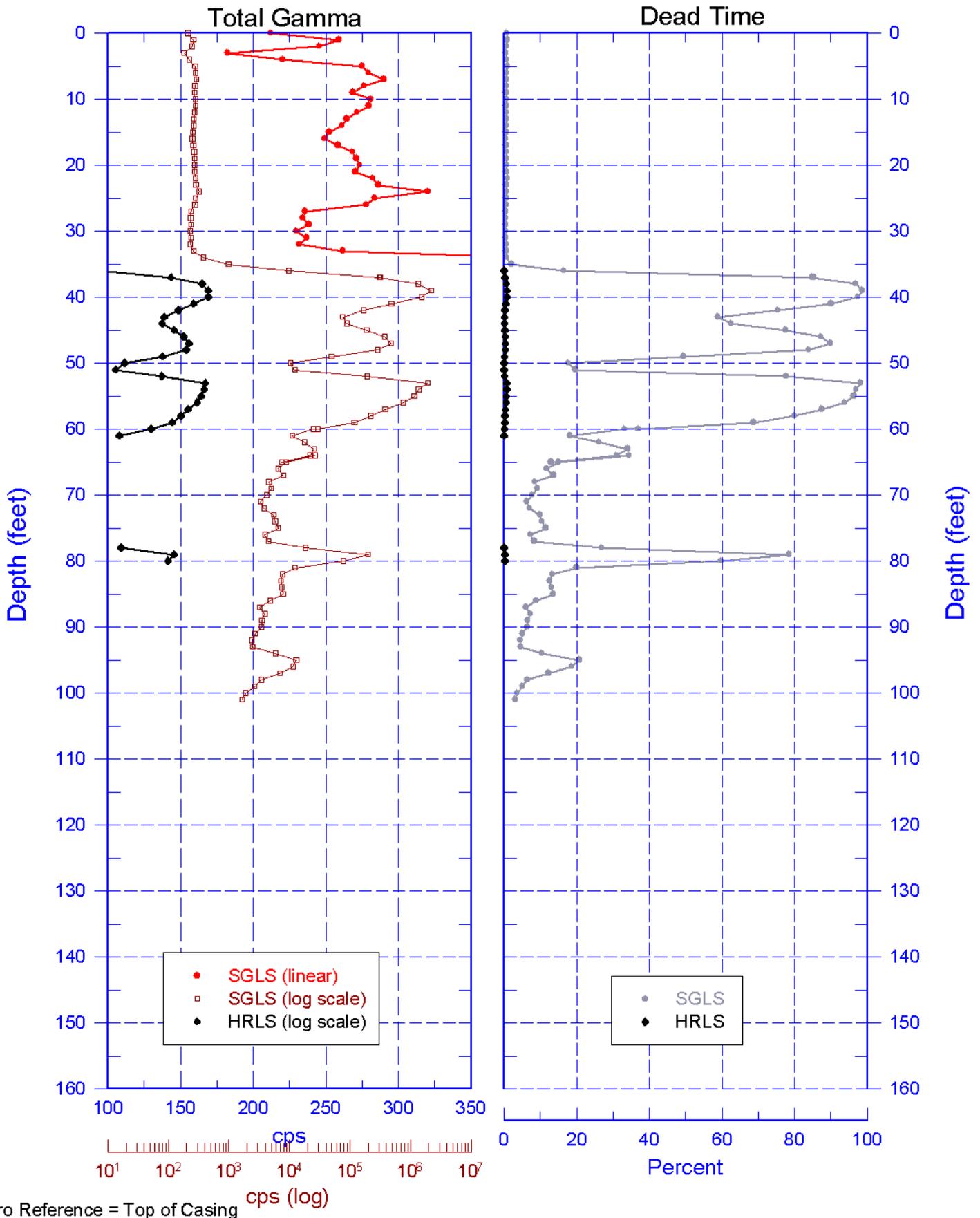


Zero Reference = Top of Casing

299-E28-76 (A6827) Total Gamma & Moisture

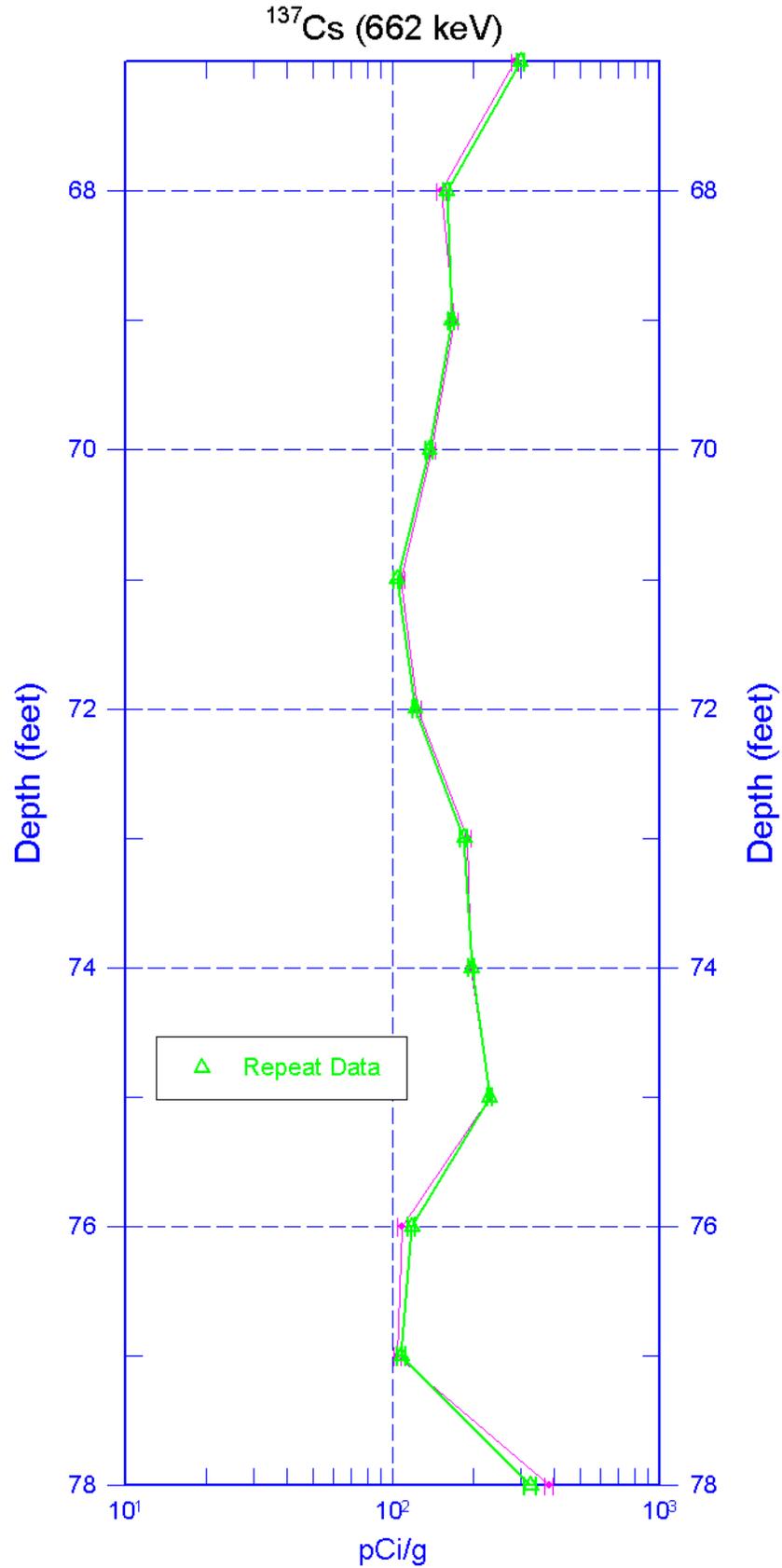


299-E28-76 (A6827) Total Gamma & Dead Time



299-E28-76 (A6827)

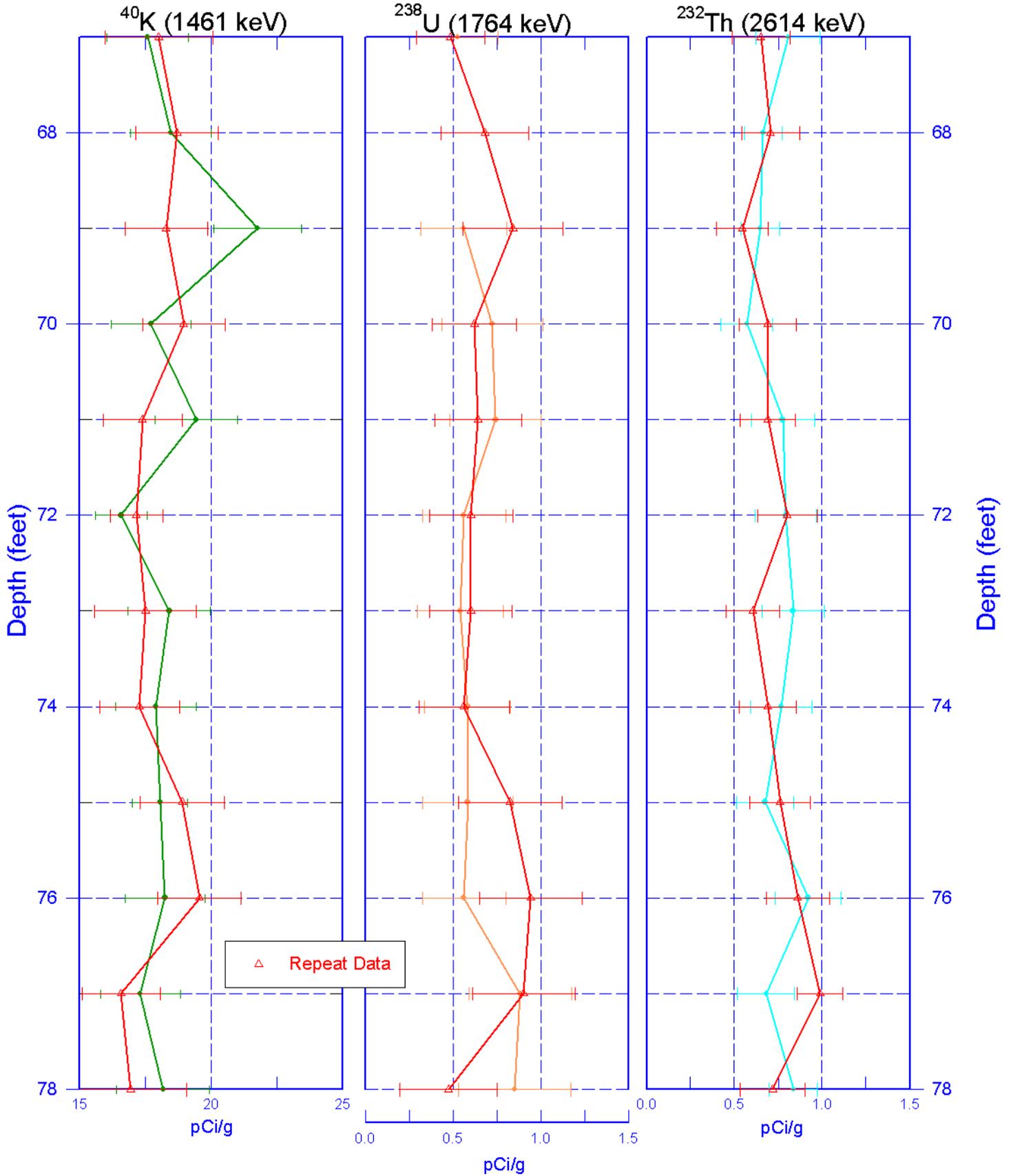
Repeat of Manmade Radionuclides



Zero Reference = Top of Casing

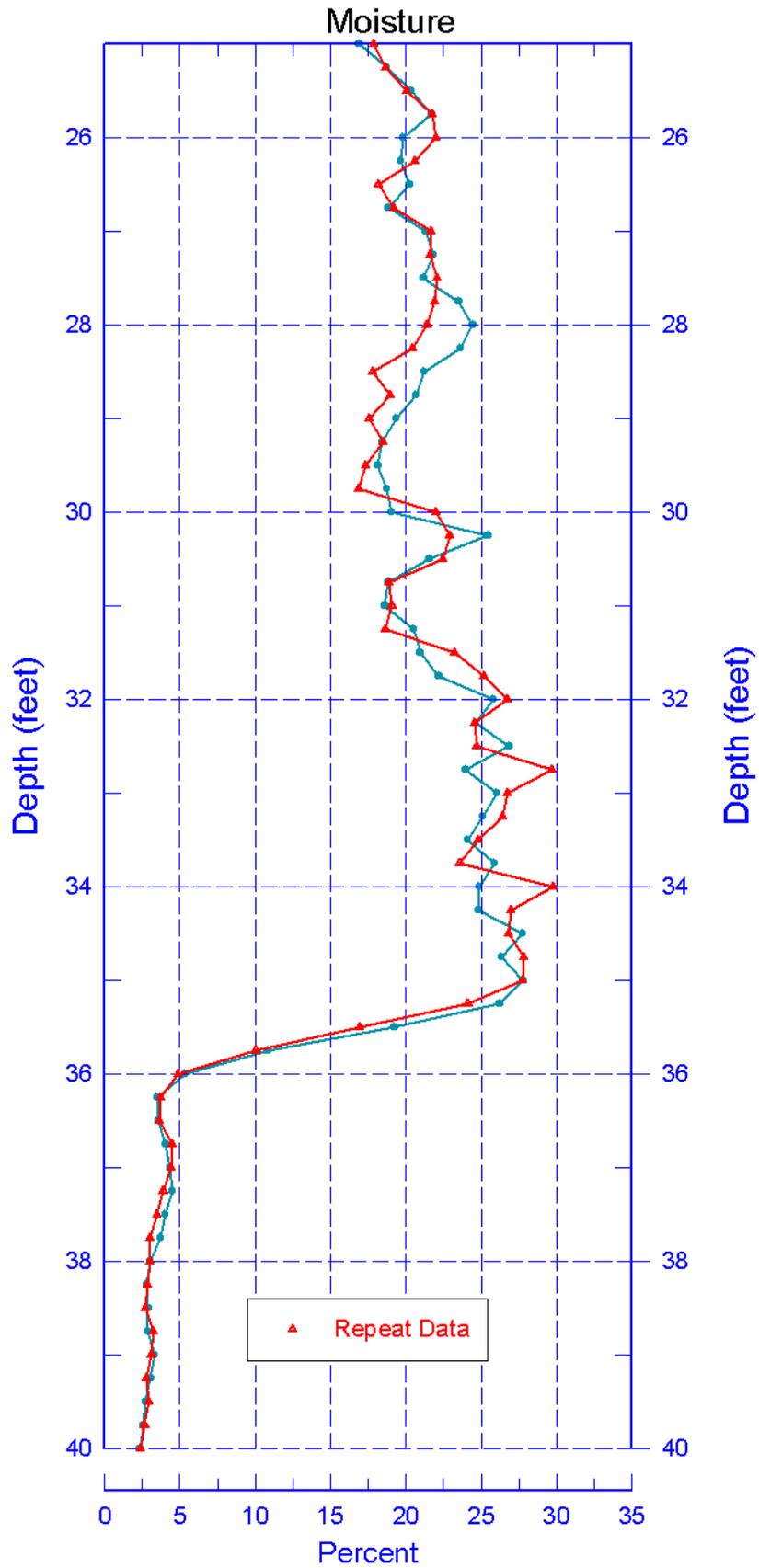
299-E28-76 (A6827)

Repeat Section of Natural Gamma Logs



Zero Reference = Top of Casing

299-E28-76 (A6827) Repeat of Moisture



Zero Reference = Top of Casing