



DOE-EM/GJ1281-2006

299-W18-12 (A7528) Log Data Report

Borehole Information:

Borehole: 299-W18-12 (A7528)		Site: 216-Z-12 Crib			
Coordinates (WA St Plane)		GWL¹ (ft): None	GW Date: 01/03/06		
North 135308.001 m	East 566439.772 m	Drill Date	TOC Elevation 209326 m	Total Depth (ft) 201	Type Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Steel	2.05	6 5/8	6	5/16	2.05	220

Borehole Notes:

The logging engineer measured the casing stick-up and diameter using a caliper and steel tape. Logging data acquisition is referenced to the TOC. According to the driller's log, contamination was encountered at 55 ft. A "very fine sand" that was moist was reported at this depth.

Logging Equipment Information:

Logging System: Gamma 4N	Type: SGLS (60%) SN: 45TP22010A
Effective Calibration Date: 08/16/05	Calibration Reference: DOE/EM-GJ953-2005 Logging Procedure: MAC-HGLP 1.6.5, Rev. 0

Logging System: Gamma 4F	Type: NMLS SN: H380932510
Effective Calibration Date: 10/14/05	Calibration Reference: DOE/EM-GJ01020-2005 Logging Procedure: MAC-HGLP 1.6.5, Rev. 0

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2	3		
Date	01/19/06	01/19/06	01/19/06		
Logging Engineer	McClellan	McClellan	McClellan		
Start Depth (ft)	201'	89'	109'		
Finish Depth (ft)	89'	3.0'	89'		
Count Time (sec)	100	100	100		
Live/Real	R	R	R		
Shield (Y/N)	NA	NA	N/A		

Log Run	1	2	3		
MSA Interval (ft)	1.0 ft	1.0 ft	1.0 ft		
ft/min	NA	NA	N/A		
Pre-Verification	DN113CAB	DN141CAB	DN141CAB		
Start File	DN111000	DN141021	DN141000		
Finish File	DN131112	DN141106	DN141020		
Post-Verification	DN113CAA	DN141CAA	DN141CAA		
Depth Return Error (in.)	-3.0"	-6.0"	N/A		
Comments	fine gain adjustment made, (files 000-001)	No fine gain adjustment made.	Repeat section.		

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	4	5	6		
Date	01/19/06	01/19/06	01/19/06		
Logging Engineer	McClellan	McClellan	McClellan		
Start Depth (ft)	3.0'	100.0'	140.0'		
Finish Depth (ft)	100.0'	200.0'	160.0'		
Count Time (sec)	NA	NA	NA		
Live/Real	NA	NA	NA		
Shield (Y/N)	NA	NA	NA		
Sample Interval (ft)	0.25'	0.25'	0.25'		
ft/min	1.0 ft/min	1.0 ft/min	1.0 ft/min		
Pre-Verification	DF092CAB	DF092CAB	DF092CAB		
Start File	DF092000	DF092389	DF092790		
Finish File	DF092388	DF092789	DF092870		
Post-Verification	DF092CAA	DF092CAA	DF092CAA		
Depth Return Error (in.)	NA	NA	1" low		
Comments	None	None.	Repeat section.		

Logging Operation Notes:

Logging was conducted without a centralizer. Measurements are referenced to top of casing.

Analysis Notes:

Analyst:	McCain	Date:	08/07/06	Reference:	GJO-HGLP 1.6.3, Rev. 0
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Pre-run and post-run verifications for the logging systems were performed before and after each day's data acquisition. SGSL acceptance criteria were met, with the exception of the fwhm for the 609 keV peak in DN141CAB, which was slightly above the upper control limit, and the net count rate for the 609 keV peak in DN141CAA, which exceeded the upper control limit by 0.4%. In both cases, the spectra were examined and found to be acceptable.

A casing correction for 5/16-in.-thick casing was applied throughout the borehole.

SGSL 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 G4NAug05.xls using an efficiency function and corrections for casing and dead time as determined from annual calibrations.

Results and Interpretations:

No evidence of manmade contamination was detected in this borehole. Spectra were evaluated for gamma activity at 312 keV ($^{233}\text{Pa}/^{237}\text{Np}$), 375 keV (^{239}Pu), 662 keV (^{137}Cs or ^{241}Am), and 722.01 keV (^{241}Am). The few cases where activity was detected at the MDA appear to be isolated statistical fluctuations.

Total gamma activity appears to follow natural radionuclide concentrations. The increase in natural uranium at 190 to 194 ft and associated decrease in potassium and thorium is indicative of a caliche layer.

The neutron moisture logging plots indicate volumetric moisture in percent.

The repeat logs all show good repeatability.

List of Log Plots:

Man-Made Radionuclide Plot (0-160 ft)

Man-Made Radionuclide Plot (150-310 ft)

Natural Gamma Logs (0-160 ft)

Natural Gamma Logs (150-310 ft)

Combination Plot (0-120 ft)

Combination Plot (110-230 ft)

Total Gamma, Dead Time, & Moisture (0-160 ft)

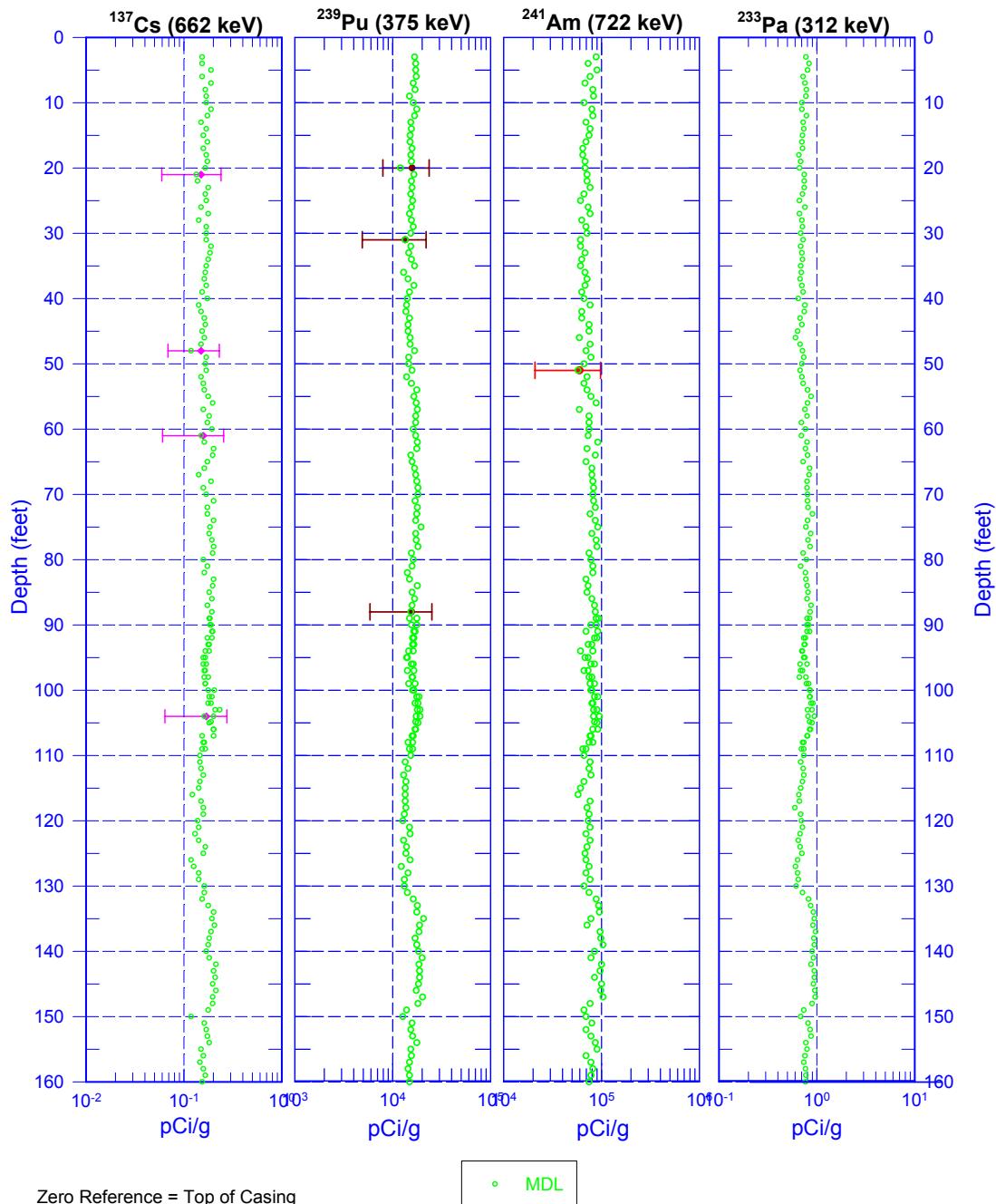
Total Gamma, Dead Time, & Moisture (150-310 ft)

Repeat Section for Natural Gamma Logs (24-30 ft)

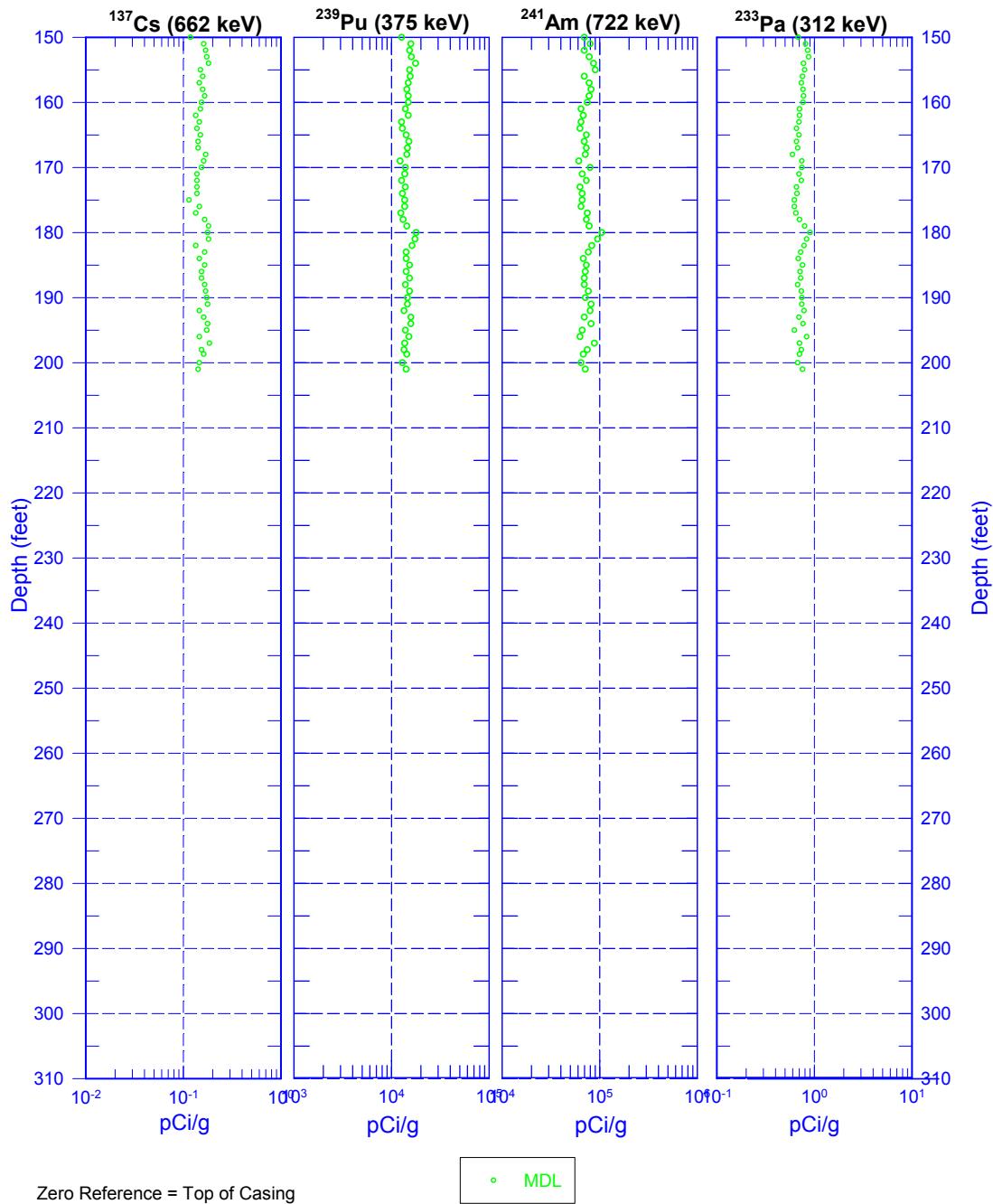
¹ GWL – groundwater level

² N/A – not applicable

299-W18-12 (A7528) Man-made Radionuclide Plot



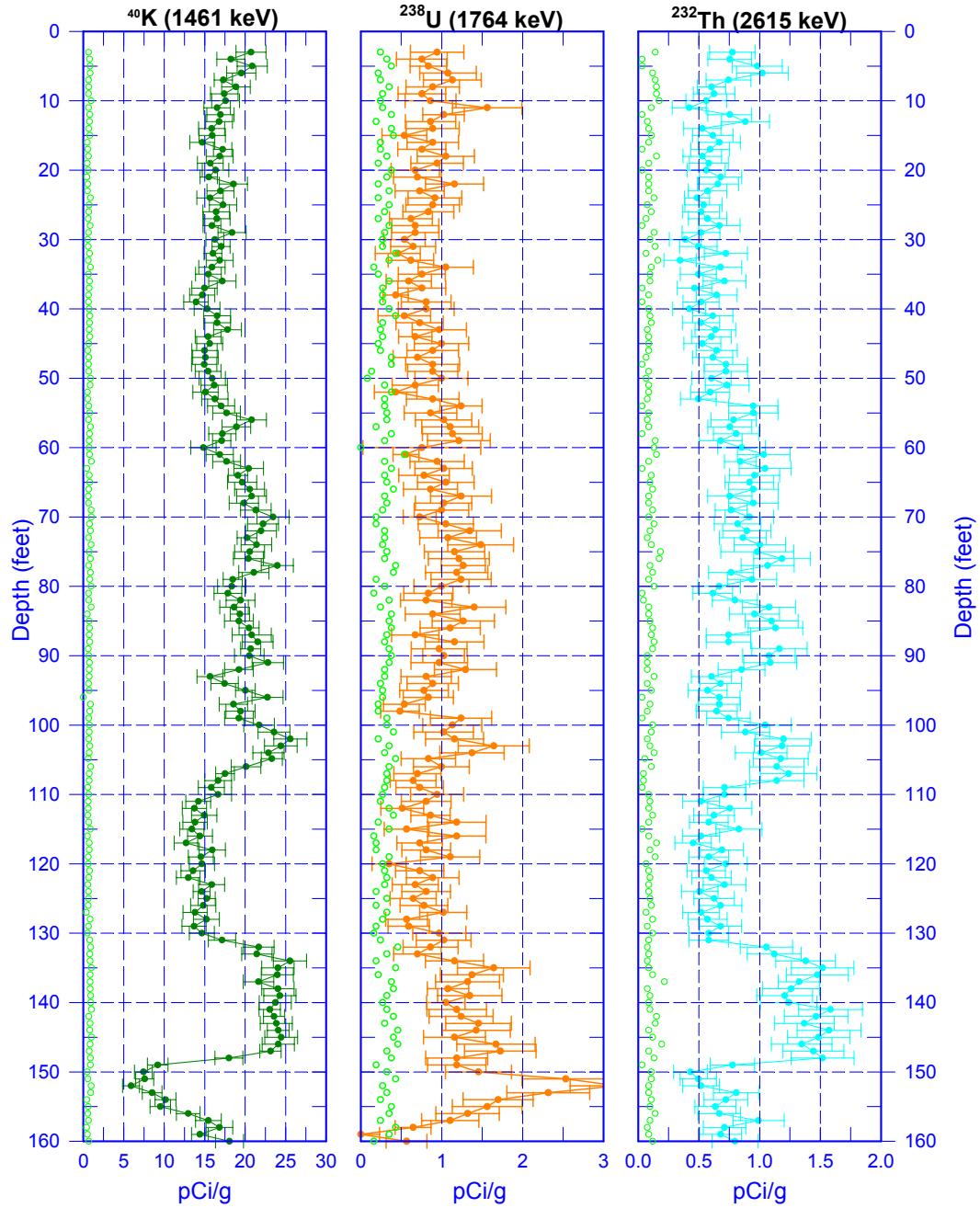
299-W18-12 (A7528) Man-made Radionuclide Plot



Zero Reference = Top of Casing

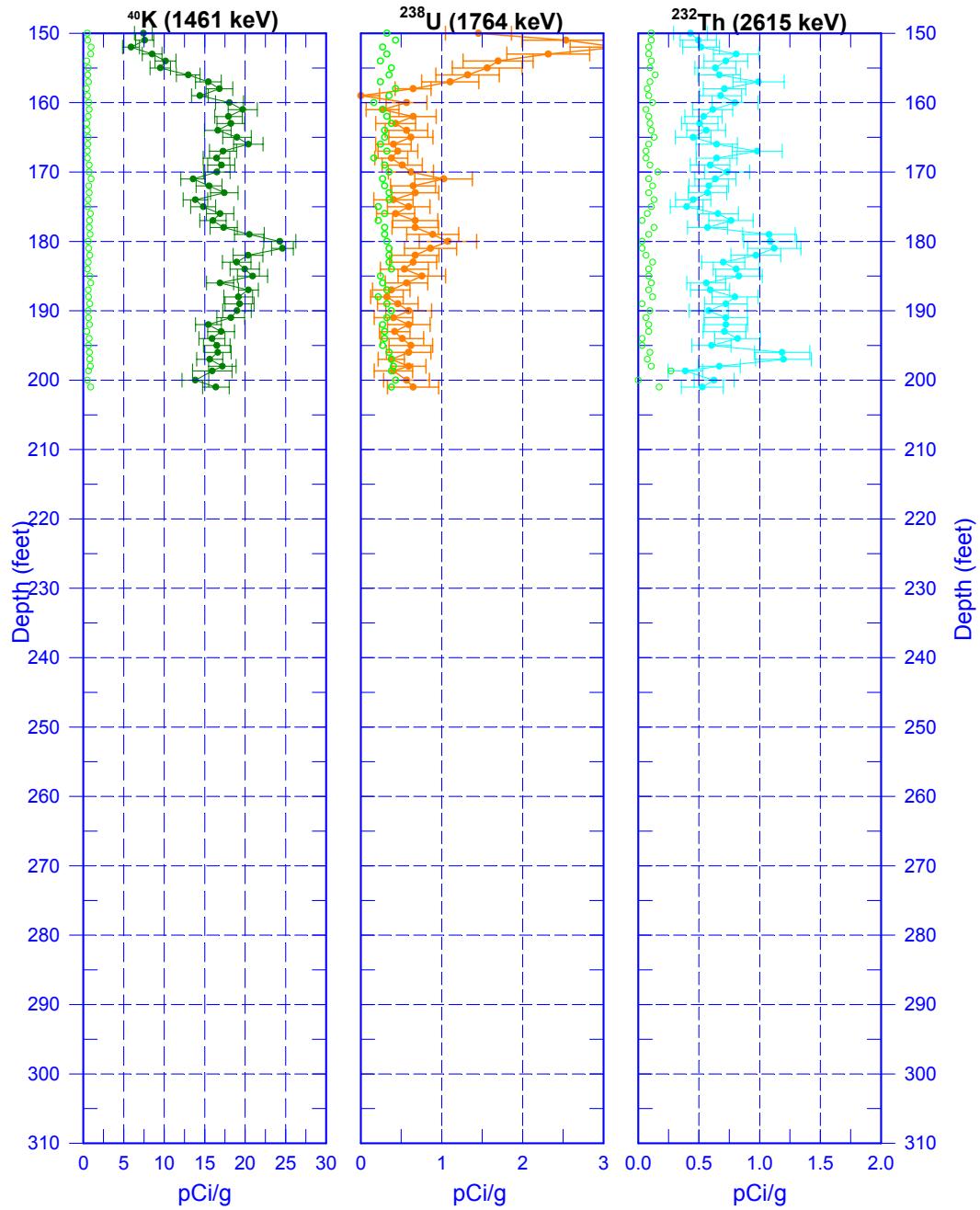


299-W18-12 (A7528) Natural Gamma Logs



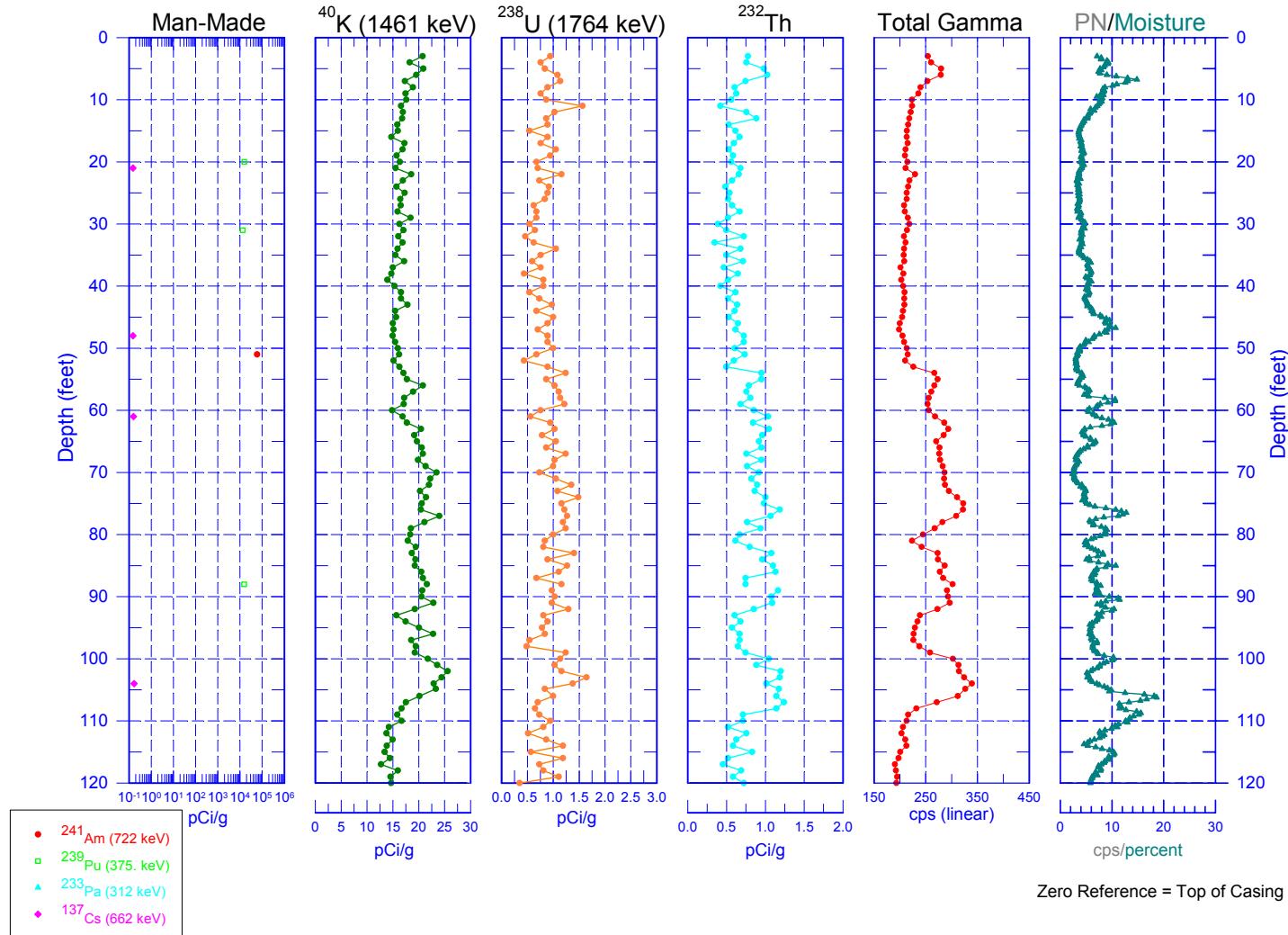
Zero Reference = Top of Casing

299-W18-12 (A7528) Natural Gamma Logs

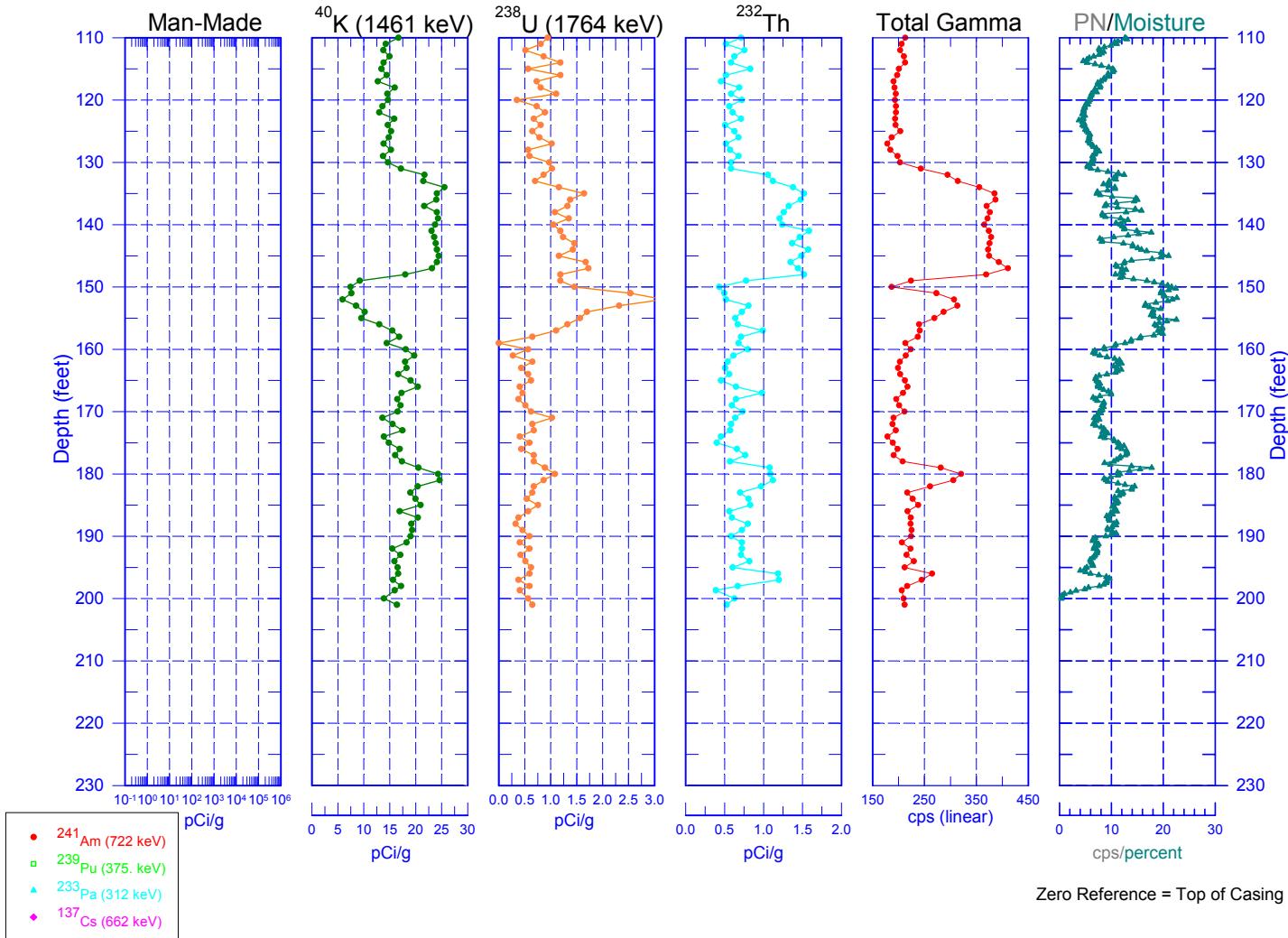


Zero Reference = Top of Casing

299-W18-12 (A7528) Combination Plot

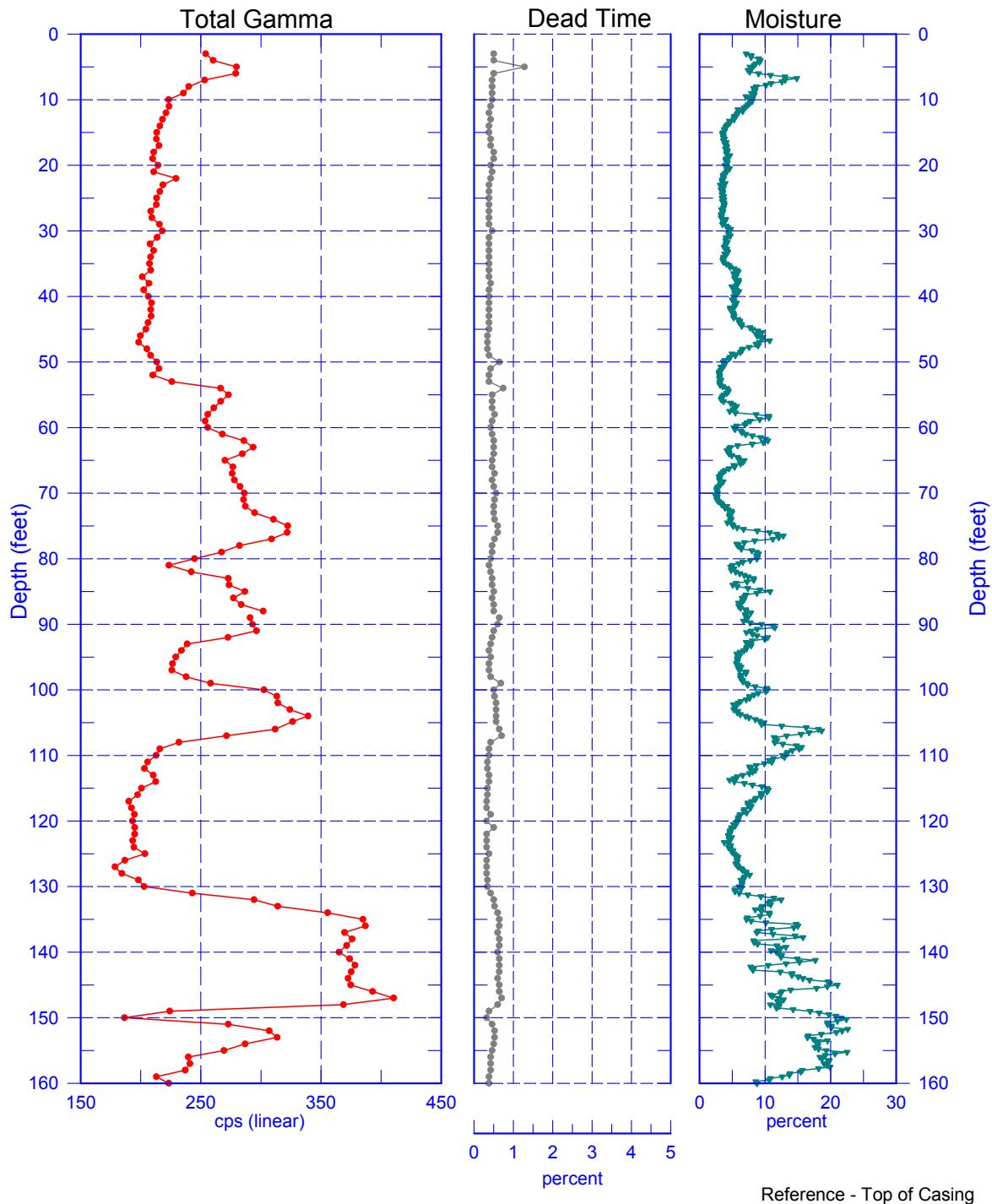


299-W18-12 (A7528) Combination Plot



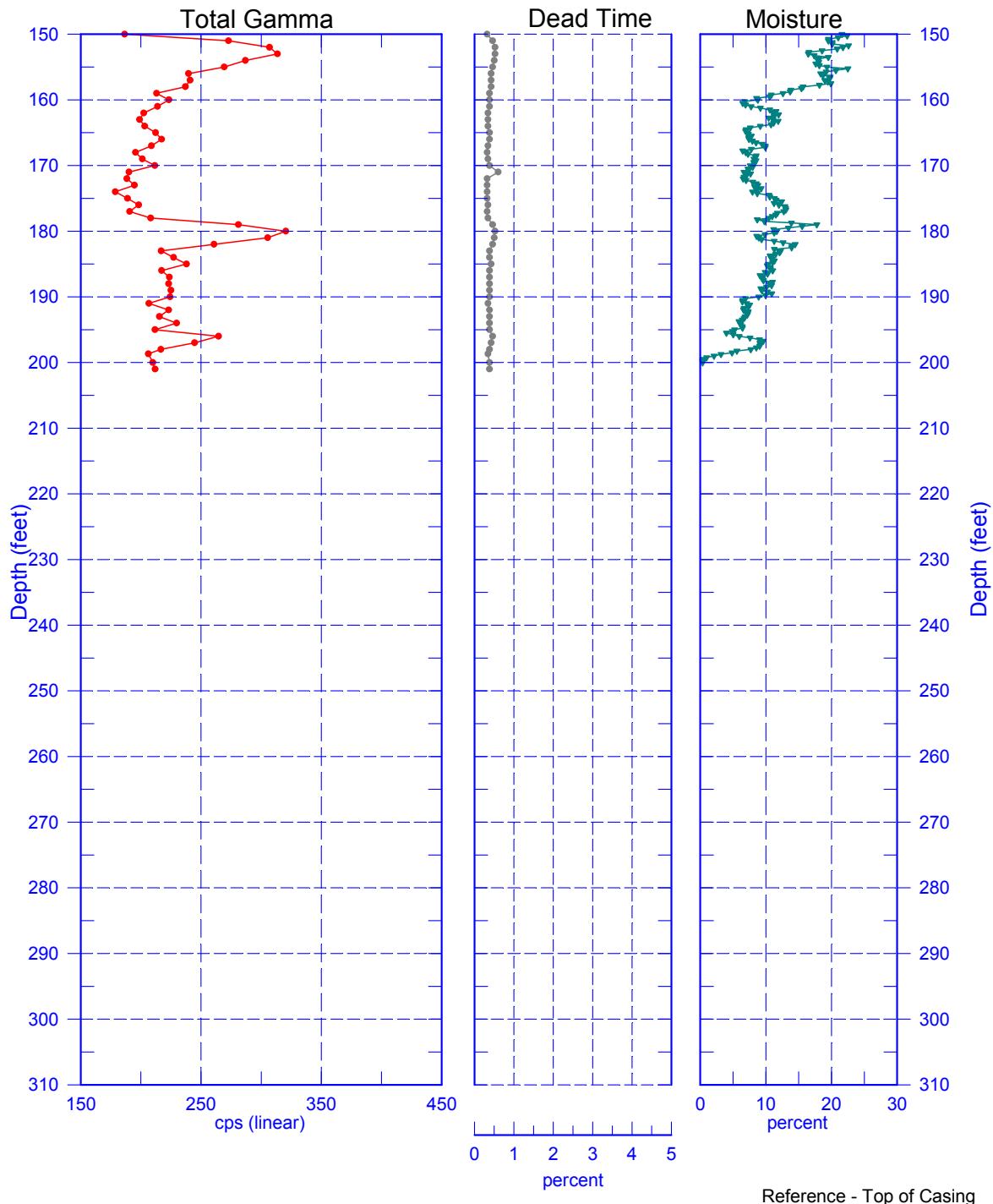
299-W18-12 (A7528)

Total Gamma, Dead Time, & Moisture



Reference - Top of Casing

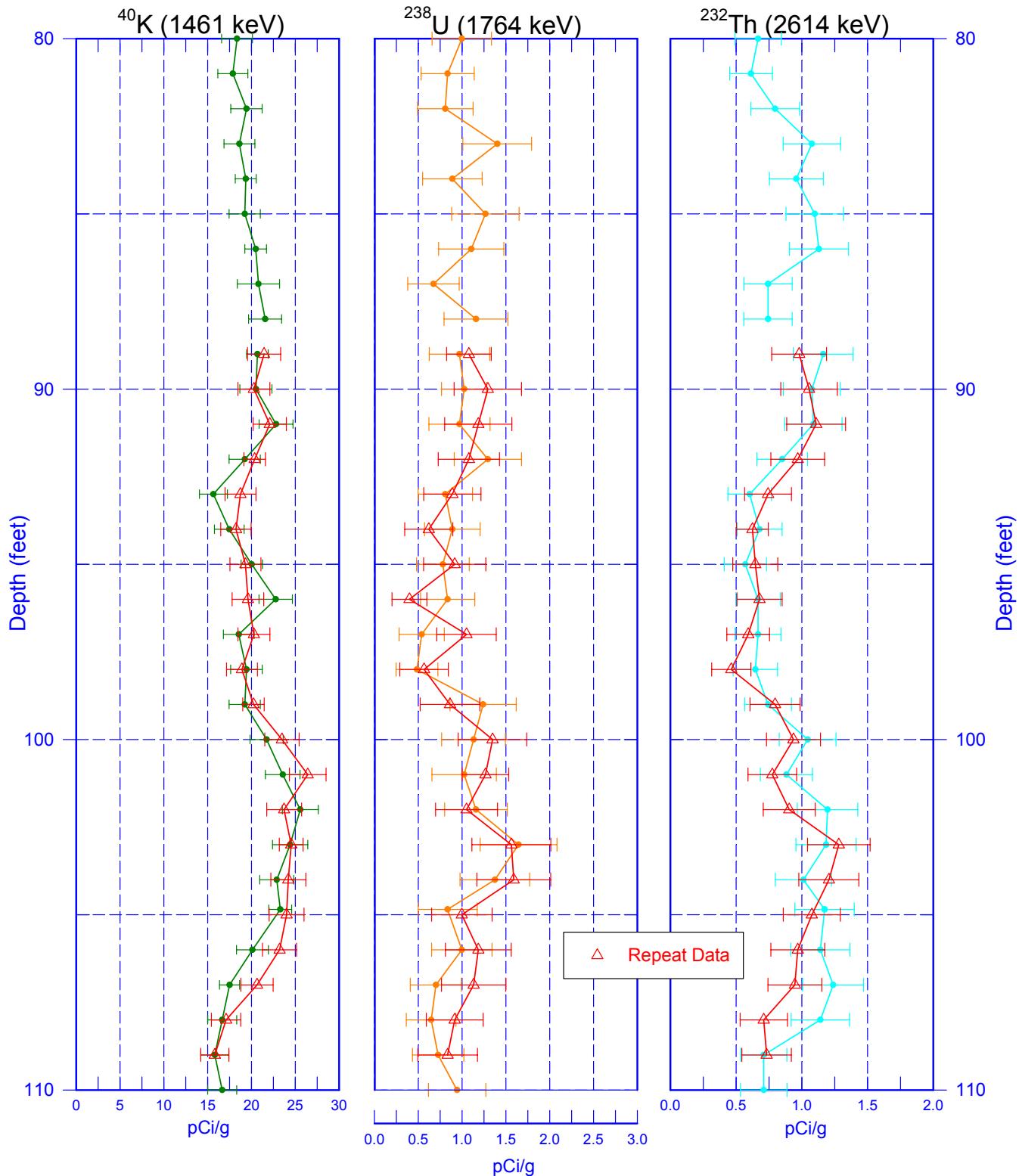
299-W18-12 (A7528)
Total Gamma, Dead Time, & Moisture



Reference - Top of Casing

299-W18-12 (A7528)

Repeat Section of Natural Gamma Logs



Zero Reference = Top of Casing