Table A1. Summary of analytical methods used for radionuclide assays of urine from Marshallese (adapted from ‡‡‡‡).

Source of data	Radionuclide	Year of collection	Chemical separation method (where applicable)	Counting method	Comments on measurement methods	Data quality
LASL (**,††,***)	^{131}I	1954	None	Gamma counting with SAC counter (see text).		Satisfactory, with low to moderate uncertainty
LASL (**,††,***)	^{131}I	1954	Urine aliquots evaporated to dryness after adjusting pH to 8–9	Total beta activity counting and decay rate measurements (8-d half-life) to confirm ^{131}I. Counting instruments not specified.	Correction for self absorption/or use of calibration standard were not mentioned. Other beta emitters will interfere.	Satisfactory, with moderate uncertainty
			Extraction/isolation method (not specified). Method used for limited data sets on 100 mL urine aliquots	Total beta activity counting and decay rate measurement to confirm ^{131}I.	Yield for extraction was thought to be about 60% of all isotopes, ^{131}I had the most significant activity in urine.	Only satisfactory within an order of magnitude due to uncertain chemical yield
	^{89}Sr		Dry or wet ashed urine of 100 mL urine aliquots (no chemical separation	Total nonvolatile beta activity and decay rate measurements (55 d) to confirm ^{89}Sr. It was predominant isotope after the decay of ^{131}I.	^{90}Sr/^{89}Sr ratio of 0.1 is assumed. Other beta emitters (^{137}Cs) will interfere.	Satisfactory, with moderate uncertainty
			Extraction/isolation method (not specified)	Total beta activity and decay rate measurement to confirm ^{89}Sr.	Chemical yield uncertain due to high variability.	High degree of uncertainty
	^{45}Ca		Extraction/isolation method (not specified)	Total beta activity counting, instruments not specified.	Data corrected for self absorption and decay. Other beta emitter can interfere.	High degree of uncertainty
	Ru (likely ^{103}Ru)		Extraction/isolation method (not specified)	Total beta activity counting, instruments not specified.	Uncorrected for self absorption. Levels of ^{103}Ru in urine are expected to be low due to poor absorption in humans (likely introducing large error in measurements).	Unreliable
	Plutonium	1954	Alpha counting	None known.	Lack of required sensitivity and non-specific to plutonium.	Unreliable
Walter Reed (Woodward et al. 1959)	^{137}Cs	1954–1957	Precipitation on nickel ferrocyanide from urine made strongly alkaline	Na I well counter with 20 channel gamma spectrometer to count precipitate.	Spectral analysis calibrated with standard source Reported measurement error of ± 5%	Satisfactory, reliable set of data
		1958	No chemical separation	Urine counted directly on 8×4 cm Na I crystal.	Large sample volume (2.5 L) Gamma-ray spectral analysis	Satisfactory, reliable set of data
	^{90}Sr	1954–1958	Precipitation as carbonate, ^{90}Y was separated and identified by its half-life	Precipitation counted using thin-window gas flow counter.	Specific separation for ^{90}Sr Data corrected for decay to time of collection Low to moderate degree of uncertainty	Satisfactory, reliable set of data

(*Continued*)

Table A1. (*Continued*)

Source of data	Radionuclide	Year of collection	Chemical separation method (where applicable)	Counting method	Comments on measurement methods	Data quality
U.S. Naval Radiological Defense Laboratory (Cronkite et al. 1956)	^{89}Sr		Oxalate precipitation using a small urine aliquot Alternative method: Carbonate precipitation of the entire 24-h urine sample, if collected later than 2.5 mo past detonation	Precipitate counted using thin-window G-M counter Standard source was used for calibration of counter Self-absorption correction was made using Sr standard	The method eliminates the normal ^{40}K The precipitation method is non-specific and ^{90}Sr could interfere if present	Satisfactory if ^{89}Sr activity is much greater than ^{90}Sr (likely to have been the case)
	^{40}Ba		Mentioned, but no information was provided	—	—	Not evaluated
	Gross beta		Mentioned, but no information provided	—	—	Not evaluated