

APPENDIX B
 MINIMUM DETECTABLE CONCENTRATIONS
 Of COMMONLY REPORTED RADIONUCLIDES

TABLE 1
 LOW BACKGROUND ALPHA/BETA GAS FLOW PROPORTIONAL COUNTER

Isotope	Matrix	Count Time	Sample	MDC	Units
		Minutes	Quantity		
Gross Alpha	Water	200	0.2	2	pCi/L
Gross Beta	Water	200	0.2	2	pCi/L
Sr-90	Water	60	0.25	2	pCi/L
Gross Alpha	Soil	200	0.1	4.1	pCi/g
Gross Beta	Soil	200	0.1	4.0	pCi/g
Sr-90	Soil	60	1	0.4	pCi/g
Gross Alpha	Smear	2	1	11	dpm/smear
Gross Beta	Smear	2	1	14	dpm/smear
Sr-90	Air	60	1	0.4	pCi/sample

TABLE 2
 LIQUID SCINTILLATION

Isotope	Matrix	Count Time	Sample	MDC	Units
		Minutes	Quantity		
C-14	Water	60	0.1	16	pCi/L
C-14	Soil	60	0.5	3.2	pCi/g
Fe-55	Water	60	0.1	33	pCi/L
Ni-63	Water	60	0.1	11	pCi/L
Ni-63	Soil	60	2	2.0	pCi/g

Tc-99	Water	60	0.1	14	pCi/L
Tc-99	Soil	60	5	0.28	pCi/g
Tritium	Water	60	0.01	290	pCi/L
Tritium	Soil	60	0.5	4.5	pCi/g

TABLE 3

ALPHA SPECTROSCOPY

Isotope	Matrix	Count Time Minutes	Sample Quantity	MDC	Units
Am-241	Water	1000	0.1	0.27	pCi/L
Pu-238	Water	1000	0.1	0.30	pCi/L
Pu-239	Water	1000	0.1	0.11	pCi/L
Th-228	Water	1000	0.1	0.08	pCi/L
Th-230	Water	1000	0.1	0.04	pCi/L
Th-232	Water	1000	0.1	0.04	pCi/L
U-234	Water	1000	0.1	0.18	pCi/L
U-235	Water	1000	0.1	0.20	pCi/L
U-238	Water	1000	0.1	0.12	pCi/L
Am-241	Soil	1000	1.0	0.05	pCi/g
Pu-238	Soil	1000	1.0	0.04	pCi/g
Pu-239	Soil	1000	1.0	0.02	pCi/g
Th-228	Soil	1000	1.0	0.04	pCi/g
Th-230	Soil	1000	1.0	0.02	pCi/g
Th-232	Soil	1000	1.0	0.01	pCi/g
U-234	Soil	1000	1.0	0.02	pCi/g

U-235	Soil	1000	1.0	0.01	pCi/g
U-238	Soil	1000	1.0	0.01	pCi/g

TABLE 4

GAMMA SPECTROSCOPY

Isotope	Energy	Matrix	Count Time Minutes	Sample Quantity	MDC	Units
Ac-228	911.07	Water	960	1	11	pCi/L
Am-241	59.54	Water	960	1	6.0	pCi/L
Bi-212	727.17	Water	960	1	50	pCi/L
Bi-214	609.31	Water	960	1	9.3	pCi/L
Co-57	122.06	Water	960	1	2.4	pCi/L
Co-58	810.76	Water	960	1	7.1	pCi/L
Co-60	1173.21	Water	960	1	4.7	pCi/L
Cs-134	795.84	Water	960	1	4.8	pCi/L
Cs-137	661.65	Water	960	1	4.8	pCi/L
Mn-54	834.83	Water	960	1	4.7	pCi/L
Pb-212	238.63	Water	960	1	5.8	pCi/L
Pb-214	351.92	Water	960	1	9.8	pCi/L
U-235	185.71	Water	960	1	4.5	pCi/L
Zn-65	1115.51	Water	960	1	11	pCi/L
Ac-228	911.07	Soil	60	700	0.14	pCi/g
Am-241	59.54	Soil	60	700	0.11	pCi/g
Bi-212	727.17	Soil	60	700	0.46	pCi/g
Bi-214	609.31	Soil	60	700	0.08	pCi/g

Co-57	122.06	Soil	60	700	0.03	pCi/g
Co-58	810.76	Soil	60	700	0.06	pCi/g
Co-60	1173.22	Soil	60	700	0.06	pCi/g
Cs-134	795.84	Soil	60	700	0.06	pCi/g
Cs-137	661.65	Soil	60	700	0.05	pCi/g
Mn-54	834.83	Soil	60	700	0.05	pCi/g
Pb-212	238.63	Soil	60	700	0.06	pCi/g
Pb-214 ^a	351.92	Soil	60	700	0.08	pCi/g
Ra-226 ^b	186.21	Soil	60	700	0.75	pCi/g
U- 235 ^c	143.76	Soil	60	700	0.24	pCi/g
U- 235 ^d	185.71	Soil	60	700	0.05	pCi/g
U-238 ^e	63.29	Soil	60	700	0.75	pCi/g
Zn-65	1115.51	Soil	60	700	0.15	pCi/g

^aThe 351.92 keV peak of Pb-214 is used for the quantification of Ra-226 in material that U and/or progeny.

^bThe 186.21 keV peak is used for the verification of Ra-226 in process material that only contains Ra.

^cThe 143.76 keV peak is used for the quantification of U-235 in the presence of Ra.

^dThe 185.71 keV peak is used for the quantification of U-235 in the absence of Ra.

^eThe 63.29 keV peak is from Th-234, the first progeny of U-238 and is used to quantify U-238.