TABLE M.5.6.1.2–1.—*Possible Additional Bounding Radiological Accident Source Terms under the Proposed Action*

Radionuclide	Quantity Present (Ci)	Release Fraction	Quantity Released (Ci)
Depleted uranium[a]			
Uranium-234	1.7×10^{-5}	1×10^{-3}	1.7×10^{-8}
Uranium-235	7.4×10^{-7}	1×10^{-3}	8.0×10^{-10}
Uranium-238	3.2×10^{-5}	1×10^{-3}	3.2×10^{-8}
Krypton-83m	1.5×10^{-1}	1.0	1.5×10^{-1}
Krypton-85	1.2×10^{-4}	1.0	1.2×10^{-4}
Krypton-85m	4.2×10^{-1}	1.0	4.2×10^{-1}
Krypton-87	2.4	1.0	2.4
Krypton-88	1.6	1.0	1.6
Niobium 98	1.2×10^{3}	1×10^{-3}	1.2
Iodine-131	5.9×10^{-2}	0.5	3.0×10^{-2}
Iodine-132	1.5×10^{-1}	0.5	7.5×10^{-2}
Iodine-132m	1.9×10^{-3}	0.5	9.5×10^{-4}
Iodine-133	6.4×10^{-1}	0.5	3.2×10^{-1}
Iodine-133m	1.0×10^{1}	0.5	5.0
Iodine-134	7.5	0.5	3.8
Iodine-134m	3.8	0.5	1.9
Iodine-135	2.2	0.5	1.1
Iodine-136	2.8×10^{2}	0.5	1.4×10^{2}
Technetium -134	2.2×10^{1}	1×10^{-3}	2.2×10^{-2}
Xenon-133	1.2×10^{-1}	1.0	1.2×10^{-1}
Xenon-133m	5.0×10^{-3}	1.0	5.0×10^{-3}
Xenon-134m	1.5×10^{1}	1.0	1.5×10^{1}
Xenone-135	6.7×10^{-1}	1.0	6.7×10^{-1}
Xenon-135m	3.0×10^{-1}	1.0	3.0×10^{-1}
Xenon-137	1.6×10^{2}	1.0	1.6×10^{2}
Xenone-138	5.3×10^{1}	1.0	5.3×10^{1}

TABLE M.5.6.1.2–1.—*Possible Additional Bounding Radiological Accident Source Terms under the Proposed Action (continued)*

Radionuclide	Quantity Present (Ci)	Release Fraction	Quantity Released (Ci)
Highly enriched uranium[b]			
Uranium-234	6.9×10^{-3}	1×10^{-3}	6.9×10^{-6}
Uranium-235	2.0×10^{-4}	1×10^{-3}	2.0×10^{-7}
Uranium-238	1.8×10^{-6}	1×10^{-3}	1.8×10^{-9}
Krypton-87	4.1	1.0	4.1
Krypton-88	2.6	1.0	2.6
Niobium 98	1.2×10^{3}	1×10^{-3}	1.2
Iodine-131	5.1×10^{-2}	0.5	2.6×10^{-2}
Iodine-132	1.3×10^{-1}	0.5	6.5×10^{-2}
Iodine-132m	3.0×10^{-2}	0.5	1.5×10^{-2}
Iodine-133	6.1×10^{-1}	0.5	3.1×10^{-1}
Iodine-133m	9.8×10^{1}	0.5	4.9×10^{1}
Iodine-134	7.9	0.5	4.0
Iodine-134m	1.7×10^{1}	0.5	8.5
Iodine-135	2.1	0.5	1.1
Iodine-136	1.8×10^{2}	0.5	9.0×10^{1}
Te-134	2.0×10^{1}	1×10^{-3}	2.0×10^{-2}
Xenon-133	1.2×10^{-1}	1.0	1.2×10^{-1}
Xenon-133m	4.9×10^{-3}	1.0	4.9×10^{-3}
Xenon-134m	3.2×10^{2}	1.0	3.2×10^{2}
Xenon-135	6.7×10^{-1}	1.0	6.7×10^{-1}
Xenon-135m	1.7	1.0	1.7
Xenon-137	1.6×10^{2}	1.0	1.6×10^{2}
Xenon-138	5.6×10^{1}	1.0	5.6×10^{1}
Tracers: iodine is bounding and representative			
Iodine-124	6.2×10^{-2}	0.5	3.1×10^{-2}
Iodine-125	6.4×10^{-2}	0.5	3.2×10^{-2}
Iodine-126	1.5×10^{-1}	0.5	7.5×10^{-2}

TABLE M.5.6.1.2–1.—*Possible Additional Bounding Radiological Accident Source Terms under the Proposed Action (continued)*

Radionuclide	Quantity Present (Ci)	Release Fraction	Quantity Released (Ci)
Inner containment vessel, weapons-grade plutonium (nonyield[c])	3 g		
Plutonium-238	1.0×10^{-2}	1×10^{-3}	1.0×10^{-5}
Plutonium-239	1.8×10^{-1}	1×10^{-3}	1.8×10^{-4}
Plutonium-240	4.0×10^{-2}	1×10^{-3}	4.0×10^{-5}
Plutonium-241	9.1×10^{-1}	1×10^{-3}	9.1×10^{-4}
Plutonium-242	2.4×10^{-6}	1×10^{-3}	2.4×10^{-9}
Americium-241	1.6×10^{-3}	1×10^{-3}	1.6×10^{-6}
Inner containment vessel, weapons-grade plutonium (with yield[d])	1 g		
Plutonium-238	3.4×10^{-3}	1×10^{-3}	3.4×10^{-6}
Plutonium-239	5.8×10^{-2}	1×10^{-3}	5.8×10^{-5}
Plutonium-240	1.3×10^{-2}	1×10^{-3}	1.3×10^{-5}
Plutonium-241	3.0×10^{-1}	1×10^{-3}	3.0×10^{-4}
Plutonium-242	7.9×10^{-7}	1×10^{-3}	7.9×10^{-10}
Nickel-65	1.6×10^{-5}	1×10^{-3}	1.6×10^{-8}
Niobium 96	3.9×10^{-6}	1×10^{-3}	3.9×10^{-9}
Niobium-97	2.8×10^{-5}	1×10^{-3}	2.8×10^{-8}
Niobium-97	5.5×10^{-4}	1×10^{-3}	5.5×10^{-7}
Niobium-98	1.6×10^{-2}	1×10^{-3}	1.6×10^{-5}
Molybdenum-93m	1.3×10^{-6}	1×10^{-3}	1.3×10^{-9}
Molybdenum-99	5.5×10^{-5}	1×10^{-3}	5.5×10^{-8}
Technetium-99	2.2×10^{-5}	1×10^{-3}	2.2×10^{-8}

Source: LLNL 2003d.

[a] Depleted uranium is already slightly radioactive; the half-life of uranium-238 (dominant isotope) is 4.5×10^{9} years. The assumed composition is 99.64% uranium-238, 0.36% uranium-235, and 0.0028% uranium-234. The quantities listed correspond to the maximum additional quantity used for the proposed action of 100 g. Fission products would result from a single target (maximum of 2.2 g) subject to a 45-MJ fusion yield, 4.6×10^{16} fissions, and would include residual fission products from previous yield experiments (60 @ 20 MJ). The fission product inventories would be peak post-experiment inventories.

[b] Highly enriched uranium is already slightly radioactive; the half-life of uranium-235 (dominant isotope) is 7.0×10^{8} years. The quantity listed corresponds to the maximum quantity used for the proposed action of 100 g. Fission products would result from a single target (maximum of 1.2 g) subject to a 45-MJ fusion yield, 4.6×10^{16} fissions, and would include residual fission products from previous yield experiments (60 @ 20 MJ). The fission product inventories would be peak post-experiment inventories.

[c] Thorium-232 is already slightly radioactive, with a half-life of 1.4×10^{10} yrs. The quantity listed corresponds to the maximum quantity used under the Proposed Action of 450 g. Fission products would result from a single target (maximum of 7.9 g) subject to a 45-MJ fusion yield, 5.3×10^{16} fissions, and would include residual fission products from previous yield experiments (60 @ 20 MJ). The fission product inventories would be peak post-experiment inventories.

[d] The assumed composition of weapons-grade material is 0.02% plutonium-238, 93.85% plutonium-239, 5.8% plutonium-240, 0.3% plutonium-241, 0.015% americium-241, and 0.02% plutonium-242. Other isotopic mixes could be used as long as their impacts would be within the bounds described here. The fission products would result from a single target (maximum of 1 g) subject to a 45-MJ fusion yield, 3.2×10^{16} fissions. Because only a single experiment would occur within a containment vessel, only the fission products resulting from this single experiment are included. The fission product inventories would be peak post-experiment inventories.

Ci = curies; g = gram; MJ = megajoules.