

**TABLE M.5.3.13.1-1.—Bounding Annual Radionuclide
Particulate Inventories in the Target Chamber (Proposed Action)**

Material	Maximum Inventory
Depleted Uranium	2.2 g/experiment ^a 100 g/yr ^b
Uranium-234	1.8×10^{-5} Ci/yr
Uranium-235	7.8×10^{-7} Ci/yr
Uranium-238	3.4×10^{-5} Ci/yr
Highly enriched uranium ^{c, f}	1.2 g/experiment ^a 100 g/yr
Uranium-234	6.9×10^{-3} Ci/yr
Uranium-235	2.0×10^{-4} Ci/yr
Uranium-238	1.8×10^{-6} Ci/yr
Thorium-232	7.9 g/experiment 450 g/yr 1.0×10^{-5} Ci/yr
Tracer elements, iodine is representative ^d	1.7×10^{-3} g/experiment 0.1 g/yr
Inner containment vessel	
Weapons-grade plutonium	3 g/experiment (non-yield) ^e
Plutonium-238	1.0×10^{-2} Ci
Plutonium-239	1.8×10^{-1} Ci
Plutonium-240	4.0×10^{-2} Ci
Plutonium-241	9.1×10^{-1} Ci
Plutonium-242	2.4×10^{-6} Ci
Americium-241	1.6×10^{-3} Ci
Weapons-grade plutonium	1 g/experiment (yield)
Plutonium-238	3.4×10^{-3} Ci
Plutonium-239	5.8×10^{-2} Ci
Plutonium-240	1.3×10^{-2} Ci
Plutonium-241	3.0×10^{-1} Ci
Plutonium-242	7.9×10^{-7} Ci
Americium-241	5.2×10^{-4} Ci
Inner containment vessel particulates	225 g

Source: LLNL 2003d.

^a The single-experiment inventory limit would result from the fission products created during a single high-yield experiment (45 MJ) as well as the buildup of the longer-lived fission products during one year of 1,200-MJ operation. Trace quantities of solid fission products would also be produced; they are not included here because of their very small impact.

^b This is the total quantity of depleted uranium that could be in the NIF target chamber at any one time. Individual targets for yield experiments would be limited to 2.2 g for depleted uranium.

^c Assumed composition is 93.5 wt% uranium-235, 5.4 % uranium-238, and 1.1 % uranium-234. Individual targets for yield experiments would be limited to 1.2 g for highly enriched uranium.

^d Other possible tracer elements include: beryllium, lithium, oxygen, neon, chlorine, argon, titanium, chromium, nickel, copper, arsenic, bromine, krypton, rubidium, yttrium, zirconium, niobium, molybdenum, rhodium, silver, iodine, xenon, neodymium, samarium, europium, thulium, lutetium hafnium tantalum, tungsten, rhenium, iridium, gold, thallium, bismuth. These are bounded by the representative tracer and could be used in similar quantities. The quantity in the table assumes 60 experiments/yr, each at 1.7 mg.

^e This is the maximum quantity of plutonium in a single experiment and present in the facility at any one time.

^f Bounds the use small quantities of specially prepared plutonium.

Ci = curies; g = grams; MJ = megajoules; yr = year.