

APPENDICES

Appendix A. Types of Radioactive Waste

The following types of radioactive waste are differentiated by the nature and intensity of the emitted radiation, as well as their physical and chemical form. They are listed roughly in order of decreasing risk to humans.

Spent fuel consists of fuel rods that have been "burned" (irradiated) uncommercial, defense, or research nuclear reactors to the point where they no longer contribute efficiently to the nuclear chain reaction. Spent fuel is thermally hot, highly radioactive, and requires heavy shielding. Commercial spent fuel is being stored at nuclear power plants pending the availability of a Federal monitored retrievable storage facility or a deep-geologic repository for disposal

High-level waste (HLW), as the term is used in this report, is generated when spent fuel is reprocessed to recover plutonium and unused uranium. The vast majority of HLW in this country has been generated in support of national defense programs. HLW is highly radioactive, generates some heat, and requires heavy shielding. Most HLW is now stored at Richland, Washington; Aiken, South Carolina; and Idaho Falls, Idaho pending availability of a deep-geologic repository.

Transuranic (TRU) waste is produced from the production of plutonium for nuclear weapons, from the manufacturing of sealed radioactive sources, and from the refurbishing or decommissioning of nuclear power plants. Transuranic waste contains radionuclides that have atomic numbers greater than 92, which is uranium. Defense TRU wastes are currently being stored at seven DOE national laboratories pending disposal in a deep-geologic repository called the Waste Isolation Pilot Project (WIPP), located near Carlsbad, New Mexico. Commercial transuranic waste is defined as low-level radioactive waste. If the concentration of transuranic radionuclides is greater than 100 nanocuries per gram, the waste is greater- than-Class-C low-level radioactive waste.

Low-level radioactive waste (LLW) includes radioactive waste not classified as uranium mill tailings, high-level waste, or spent fuel. About 95 percent of all LLW -- Class A -- has relatively low levels of radioactivity. Class A waste remains hazardous for about 100 years, Class B and C waste remains hazardous for a few hundred years, while GTCC waste remains hazardous for a few hundred to a few thousand years.

Uranium mill tailings are the earthen residues -- coarse sand and a "slime" of clay-like particles -- that remain after extracting uranium from mined uranium ore. These tailings contain low concentrations of radioactive material, but tailing volumes are very large.

Byproduct Material is material contaminated or made radioactive during the production or use of special nuclear material.

Source: Adapted from the League of Women Voters Education Fund, 1985