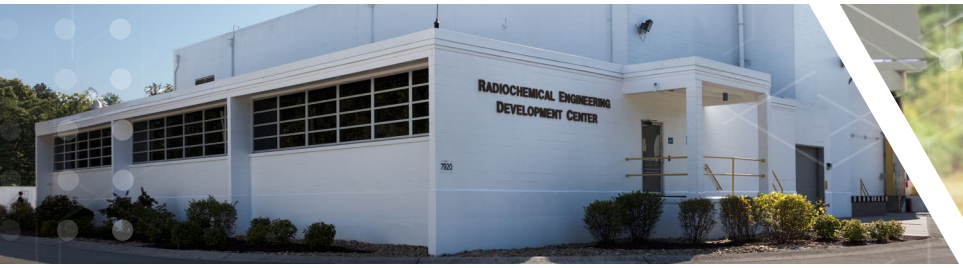
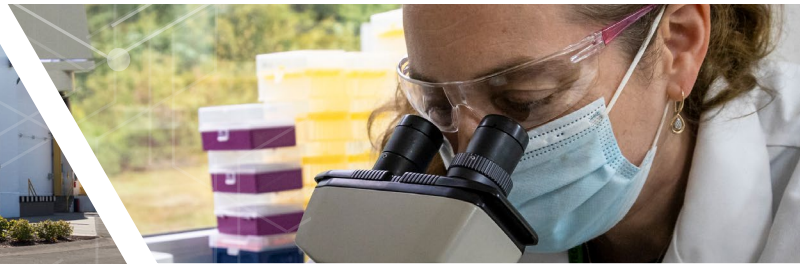
Multipurpose Radiochemical Processing and Research Facility

Radiochemical Engineering Development Center





At the Radiochemical Engineering Development Center (REDC), experts in radiochemical processing use specialized equipment and systems to produce unique radioisotopes for applications in research, national security, medicine, space exploration, and industry.

The REDC complex – Building 7920, built in 1966, and Building 7930, built in 1968 – are designated as Hazard Category 2 nuclear facilities and include hot and cold laboratories, heavily shielded hot cells, glove boxes, and high bay space. There, experts safely handle alpha and neutron emitters and work with some of the most exotic and rare materials on the planet.

Isotope R&D and Production

REDC provides world-class capabilities in isotope production, research and development, source fabrication, and the distribution of various unique isotopes. REDC is a key resource for the Office of Science Isotope Program and other US Department of Energy and National Nuclear Security Administration programs advancing materials science, nuclear science and technology, chemistry, nuclear security, and neutron science.

REDC pioneered many radiochemical separation processes and continues to drive innovation for the production, recovery, and purification of radioisotopes for shipment worldwide. Current primary mission areas include producing plutonium-238 for NASA's radioisotope power systems; isotopes for targeted alpha therapy cancer treatments; transcurium elements (Cf, Bk, Es, Fm) for industrial and research applications; and isotopes such as Cf-252, Se-75, and Ni-63 for industry, national security, and nuclear nonproliferation. Uses include detecting explosive residues at airport security checkpoints; radiology; monitoring coal, cement, and other materials; and analyzing fissile and transuranic material waste.

REDC has contributed to major scientific impacts: supplying heavy actinide isotopes for the discovery of new superheavy element and isotopes, including tennessine, the second-heaviest and most recently discovered element; research on the physics of heavy elements, electron behavior in orbitals, nuclear properties, and nuclear reactions; and research on the chemistry of heavy actinides, chemically stable compounds, the crystal structure of salts, solution chemistry, and spectroscopy.

Specifications

7920: 9 hot cells with associated tanks and process equipment

7930: 7 hot cells

7920: Windows of lead glass and mineral oil

7930: Windows of lead glass with zinc bromide

High-density concrete used for front, rear, sides, and top shielding of hot cells

All primary and secondary confinement systems exhaust streams; off-gas systems enable safe and compliant radiochemical processing

Fiberoptic access for online spectroscopic monitoring of chemical processes; capable of expanding in-cell and near-cell instrumentation

Pneumatic transfer system between facilities

7920: Pneumatic motor-driven intercell conveyer systems

7930: Pneumatic transfer tube system

In-cell remote manipulators and glove boxes; 50-ton bridge crane in high bay for remote transfer of materials

Susan Hogle

Division Director, Radioisotope Science and Technology Division

865-576-2887