



Durango, Colorado, Disposal Site Long-Term Surveillance and Maintenance Program



U.S. Department of Energy
Grand Junction Office

FACT SHEET

The Grand Junction Office has provided cost-effective and efficient stewardship for more than 10 years

Overview

Uranium ore was processed near Durango, Colorado, between 1942 and 1963. These operations created process-related wastes and tailings, a sandlike material containing radioactive materials and other contaminants. In 1990, the U.S. Department of Energy (DOE) encapsulate the tailings in an engineered disposal cell located at Bodo Canyon, southwest of Durango.

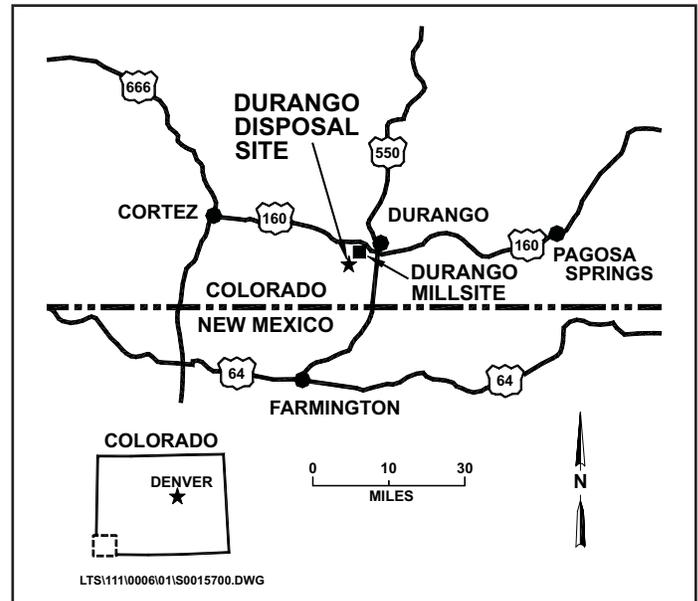
The U.S. Nuclear Regulatory Commission included the Durango Disposal Cell under general license in 1996. DOE is responsible, under the general license, for the long-term custody, monitoring, and maintenance of the site. The DOE Long-Term Surveillance and Maintenance (LTSM) Program at the DOE Grand Junction (Colorado) Office is responsible for the long-term safety and integrity of the disposal site.

In 1988, DOE established the Long-Term Surveillance and Maintenance (LTSM) Program to provide stewardship of disposal cells that contain low-level radioactive material after completion of environmental restoration activities. The mission of the LTSM Program is to ensure that the disposal cells continue to prevent the release of contaminated materials to the environment. These materials will remain potentially hazardous for thousands of years. As long as the disposal cells function as designed, risks to human health and the environment are negligible.

The LTSM Program maintains the safety and integrity of the disposal cell through periodic monitoring, inspections, and maintenance; serves as a point of contact for stakeholders; and maintains an information repository at the DOE Grand Junction Office for all sites in the LTSM Program.

Regulatory Setting

Congress passed the Uranium Mill Tailings Radiation Control Act in 1978 (Public Law 95-604) that specified remedial action for 24 inactive millsites where uranium was produced for the Federal Government. DOE remediated these sites under the Uranium Mill Tailings Remedial Action Project and encapsulated the radioactive material in U.S. Nuclear Regulatory Commission-approved disposal cells. Cleanup standards were promulgated by the U.S. Environmental Protection Agency in Title 40 *Code of Federal Regulations* (CFR)



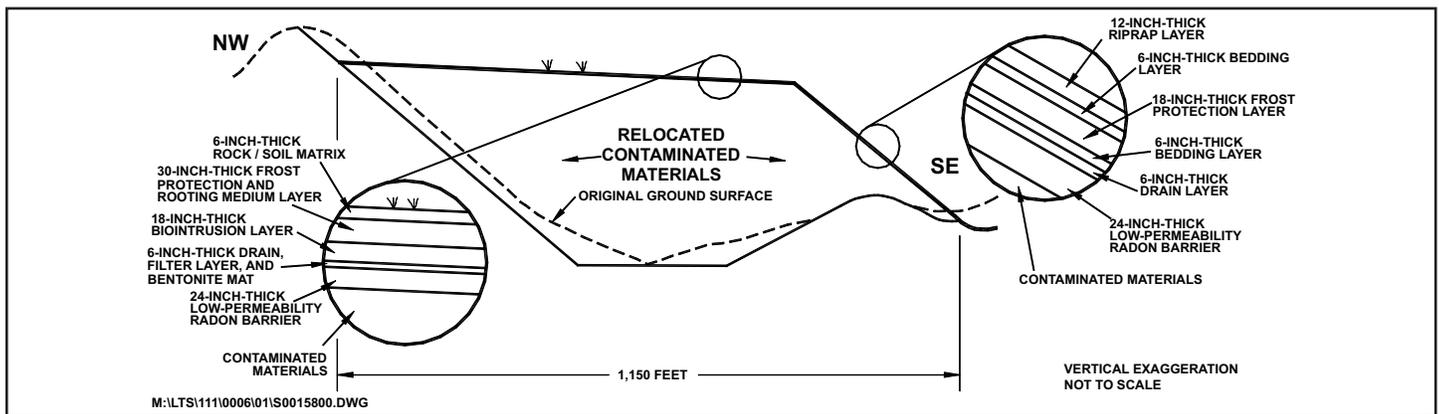
Part 192. The U.S. Nuclear Regulatory Commission license was issued in accordance with 10 CFR 40.

Durango Disposal Site

The Durango Disposal Site is in La Plata County, approximately 3.5 miles southwest of Durango, above the west end of Bodo Canyon. This disposal site is bordered by Smelter Mountain on the north and Carbon Mountain on the south. In 1990, the State of Colorado acquired 120 acres of land from the U.S. Bureau of Land Management for the disposal site. Subsequently, the Bodo Canyon site was permanently transferred to DOE. The predominant land use in the surrounding area is grazing and wildlife habitat; the immediate region is sparsely populated.

The Durango mill was constructed on the site of a former lead smelter that operated from 1880 to 1930. Vanadium Corporation of America constructed and operated the mill from 1942 to 1946 to produce vanadium. Between 1949 and 1963, the mill produced uranium oxide under contract to the U.S. Atomic Energy Commission. Milling activities produced 1.2 million cubic yards of tailings and resulted in contamination of 33 acres of millsite property.

The U.S. Nuclear Regulatory Commission and State of Colorado concurred with DOE's remedial action plan to relocate the mill tailings and associated contaminated



Northwest-Southeast Cross Section of Durango Disposal Cell

materials to the Bodo Canyon site for permanent disposal. Remediation was completed in 1990. The disposal cell contains 3,460,000 dry tons (approximately 2.5 million cubic yards) of contaminated material, including tailings, building debris from demolished mill structures, and material from contaminated vicinity properties with a total activity of 1,400 curies of radium-226.

The disposal site is located near the north edge of the San Juan Basin. Bedrock beneath the site dips south toward the center of the basin. The uppermost aquifer beneath the Bodo Canyon site is in the Cliff House Sandstone of the Mesa Verde Group. Groundwater in this aquifer is generally not suitable for domestic use because of the relatively high levels of total dissolved solids and the variable quality of the water.

Cell Design

The Durango Disposal Cell measures approximately 2,400 feet by 1,300 feet, including the surrounding rock apron. It occupies approximately 42 acres of the 120-acre site. The perimeter of the disposal site is not fenced, but 82 warning signs define the site boundary.

The cover of the Durango Disposal Cell is a multi-component system designed to encapsulate and protect the contaminated materials for a period of 1,000 years. A low-permeability radon barrier, consisting of multiple layers of compacted clayey soil and an overlying bentonite geomembrane mat, covers the contaminated materials. This layer is designed to reduce radon emissions. The radon barrier is protected by a sand filter/ drainage layer, over which a rock bioinfiltration layer was placed. Above this was placed a frost-protection/ rooting medium layer. The top slope of the cell is covered with a rock/soil matrix layer; the side slopes are covered with rock (riprap) to protect against wind and water erosion. The top of the disposal cell is planted with native grasses. Riprap is keyed into competent bedrock around the bottom of the cell to prevent head-cutting erosion at the cell boundary.

The cell design promotes rapid runoff of precipitation to minimize leachate. Runoff from the top slope of the cell

flows to a surrounding rock apron that carries water away from the cell. Natural vegetation has been re-established in disturbed areas at the site.

Compaction of contaminated materials caused pore water to be expelled as seepage, which is diverted to a holding pond. The water in the pond is treated periodically and discharged in accordance with a wastewater discharge permit issued by the Colorado Department of Public Health and Environment. This pond and treatment system will be removed when the seepage stops.

LTSM Program Activities

The LTSM Program manages the site according to a long-term surveillance plan (LTSP) prepared specifically for the Durango site. Under provisions of the LTSP, the LTSM Program (1) conducts annual inspections of this site to evaluate the condition of surface features, (2) performs site maintenance as necessary, and (3) monitors groundwater.

Groundwater is monitored at the Durango Disposal Site to demonstrate the effectiveness of the cell in isolating the encapsulated wastes from the local groundwater system. The disposal cell at Durango is designed and constructed to last for 200 to 1,000 years. However, the general license has no expiration date, and DOE understands that its responsibility for the safety and integrity of the Durango site will last indefinitely.

Contacts

For more information about the LTSM Program or the Durango Disposal Site, contact

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or visit the Internet site at

<http://www.gjo.doe.gov/programs/ltsm>