U.S. DEPARTMENT OF ENERGY | Legacy Management

Bluewater, New Mexico, Disposal Site

FACT SHEET

This fact sheet provides information about the Uranium Mill Tailings Radiation Control Act of 1978 Title II disposal site at Bluewater, New Mexico. This site is managed by the U.S. Department of Energy Office of Legacy Management.

Site Description and History

The Bluewater Disposal Site is in Cibola County in west-central New Mexico. Anaconda Copper Company constructed the original carbonate-leach mill at the site in 1953 to process uranium ore. The mill had a production capacity of 300 tons of ore per day. A discovery of sandstone uranium ores in the area led to construction of an acid-leach mill at the site that began operations in 1957. The carbonate-leach mill closed in 1959, and production in the acid-leach mill was reduced for economic reasons. The acid-leach mill resumed full operations in 1967, and the capacity of the mill had increased to 6,000 tons of ore per day by 1978. Milling operations at the site ended on February 14, 1982. In 1986, the Anaconda Copper Company became the Atlantic Richfield Company (ARCO).

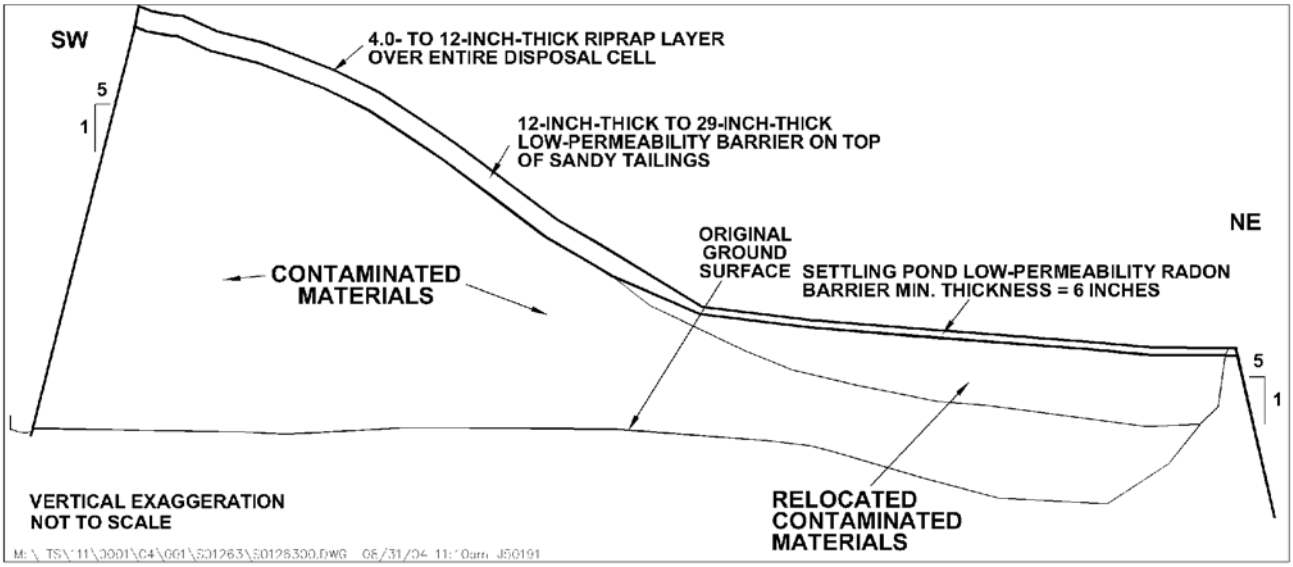
Uranium-ore processing at the Bluewater mill produced radioactive tailings, a predominantly sandy material. The tailings were conveyed in slurry from the mill to two locations, depending on the milling method. The acid-leach tailings were segregated from the carbonate-leach tailings to prevent chemical reactions from occurring as a result of mixing acidic and basic compounds. Process water in the tailings slurry leached into the underlying San Andres aquifer and contaminated the ground water; the main constituents of concern are molybdenum, selenium, and uranium.

ARCO began decommissioning the mill in 1989 and began site reclamation in 1991. By 1995, all mill tailings, contaminated soils, demolished mill structures, and contaminated vicinity property materials were encapsulated in three on-site disposal areas. These areas are the main disposal cell, which comprises the acid tailings and the contiguous south bench disposal area; the carbonate tailings cell and a contiguous asbestos disposal area; and the polychlorinated biphenyl (PCB) disposal cell, which contains uranium mill tailings and soils mixed with PCBs. More than 80 percent of the total tailings material is encapsulated in the main disposal cell.

Location of the Bluewater Disposal Site

Regulatory Setting

Congress passed the Uranium Mill Tailings Radiation Control Act (UMTRCA) in 1978 (Public Law 95-604). The Bluewater site is under the jurisdiction of Title II of UMTRCA, which applies to uranium millsites that were under active U.S. Nuclear Regulatory Commission (NRC) license when UMTRCA was passed. Title II of the legislation specifies that after reclamation is completed, long-term custody of the site is the responsibility of either the federal government or the host state, at the option of the state. New Mexico declined to become the long-term custodian of the Bluewater site, and the U.S. Department of Energy (DOE) assumed custodial responsibility. Under Title II of UMTRCA, the licensee, ARCO, was responsible for remedial action. NRC's cleanup and reclamation standards are promulgated in Title 10 *Code of Federal Regulations* (CFR) Part 40, Appendix A. These standards conform to U.S. Environmental Protection Agency (EPA) standards in 40 CFR 192. The site was



Southwest-Northeast Cross Section of the Main Disposal Cell at the Bluewater Disposal Site

included under NRC's general license for long-term custody in 1997. At that time, title to the site transferred from ARCO to DOE.

Disposal Site

The site comprises 3,300 acres; about one-third of which (the southern and western parts) is covered by basalt that may have flowed as recently as 2,000 to 4,000 years ago. Much of the remainder of the site is covered with fine-grained material deposited by wind and water. The region around the disposal site is sparsely populated, and the main land use near the site is grazing. A barbed-wire perimeter fence encloses the entire site.

Compliance Strategy

Several years of active treatment by pumping contaminated ground water from the aquifer produced no significant reduction in concentrations of molybdenum, selenium, and uranium. In 1990, ARCO applied to NRC for alternate concentration limits. Alternate concentration limits may be adopted within specified areas when established maximum concentration limits are unattainable, providing the alternate concentration limits do not pose a present or potential future hazard to human health or the environment. NRC approved the application in 1996.

PCB-contaminated waste was discovered during reclamation of the mill. At the time of the discovery, no commercial waste disposal facility in the United States was licensed to accept radioactive waste contaminated with PCBs. These wastes were regulated under the Toxic Substances Control Act, which is under EPA's jurisdiction. ARCO proposed encapsulating the wastes on site in a separate disposal cell. After resolution of several issues, EPA agreed to issue a permit for the proposed disposal approach, provided that ARCO conducted ground water monitoring and maintained the appropriate records. DOE concurred with the disposal subject to an indemnification agreement whereby ARCO agreed to cover future costs that may result from the PCB disposal.

The compliance strategy includes annual ground water monitoring at nine monitor wells located inside the site boundary. Samples are analyzed annually for PCBs and every 3 years for molybdenum, selenium, and uranium.

Disposal Cell Design

The main disposal cell covers about 320 acres and contains an estimated 23 millions tons (16 million cubic yards) of tailings and other contaminated materials having a total activity of about 11,200 curies of radium-226. The cover of the main disposal cell is a two-layer system designed to encapsulate and protect the contaminated materials. The cover consists of a low-permeability radon barrier (first layer placed over compacted tailings) and a rock (riprap) erosion protection layer.

The carbonate tailings cell covers about 65 acres and contains an estimated 1.3 million tons (930,000 cubic yards) of contaminated materials having a total activity of about 1,130 curies of radium-226. Layers of barrier material and riprap similar to those on the main disposal cell also cover the carbonate tailings cell to protect the cover from erosion.

The PCB disposal cell is less than 1 acre and contains PCB-contaminated material sealed in 144 drums placed on a 3-foot-thick clay liner. Voids between the drums were filled with a soil-cement mixture to prevent

long-term subsidence. The PCB disposal cell cover consists of a 36-inch-thick clay cap, an 18-inch-thick radon barrier, and a 6-inch-thick layer of riprap for erosion protection.

Disturbed areas around the cells have all been regraded and seeded with native vegetation.

Legacy Management Activities

DOE manages the disposal site according to a site-specific Long-Term Surveillance Plan to ensure that the disposal cell systems continue to prevent release of contaminants to the environment. Under provisions of this plan, DOE conducts annual inspections of the site to evaluate the condition of surface features, performs site maintenance as necessary, and monitors ground water to verify the continued integrity of the disposal cells and to verify that contaminated ground water does not migrate off the site. The encapsulated materials will remain potentially hazardous for thousands of years.

In accordance with 40 CFR 192.32, the disposal cells are designed to be effective for 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years. However, the general license has no expiration date, and DOE's responsibility for the safety and integrity of the Bluewater disposal cells will last indefinitely.

Contacts

Documents related to the Bluewater Disposal Site are available on the DOE Office of Legacy Management website at http://www.LM.doe.gov/land/sites/nm/bluewater/blue.htm.

For more information about DOE Office of Legacy Management activities at the Bluewater Disposal Site, contact

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