Fact Sheet

U.S. DEPARTMENT OF ENERGY | Legacy Management

Maybell West, Colorado, Disposal Site

An UMTRCA Title II site

This fact sheet provides information about the **Maybell West disposal site**. This site is managed by the **U.S. Department of Energy Office of Legacy Management** under **Title II** of the **Uranium Mill Tailings Radiation Control Act of 1978**.

Site Information and History

The Maybell West disposal site is in Moffat County in northwest Colorado. The site is located in a historical uranium-mining district characterized by rolling terrain and small, dry washes that flow only during periods of intense rainfall. The washes drain to the Yampa River, about 2 miles southwest of the site. Vegetation is generally sparse and consists primarily of sagebrush, saltbush, and short grasses.

The Miocene Browns Park Formation directly underlies the site and is the host rock for the uranium ore in the area. This formation is composed of white to light gray and tan sandstone with thin layers of conglomerate, siltstone, and minor limestone lenses. The thickness of the Browns Park Formation is variable but is believed to be approximately 1,000 feet at the site. Groundwater occurs within the Browns Park Formation at a depth of about 200 feet below ground surface. Groundwater ultimately discharges to the Yampa River southwest of the site.

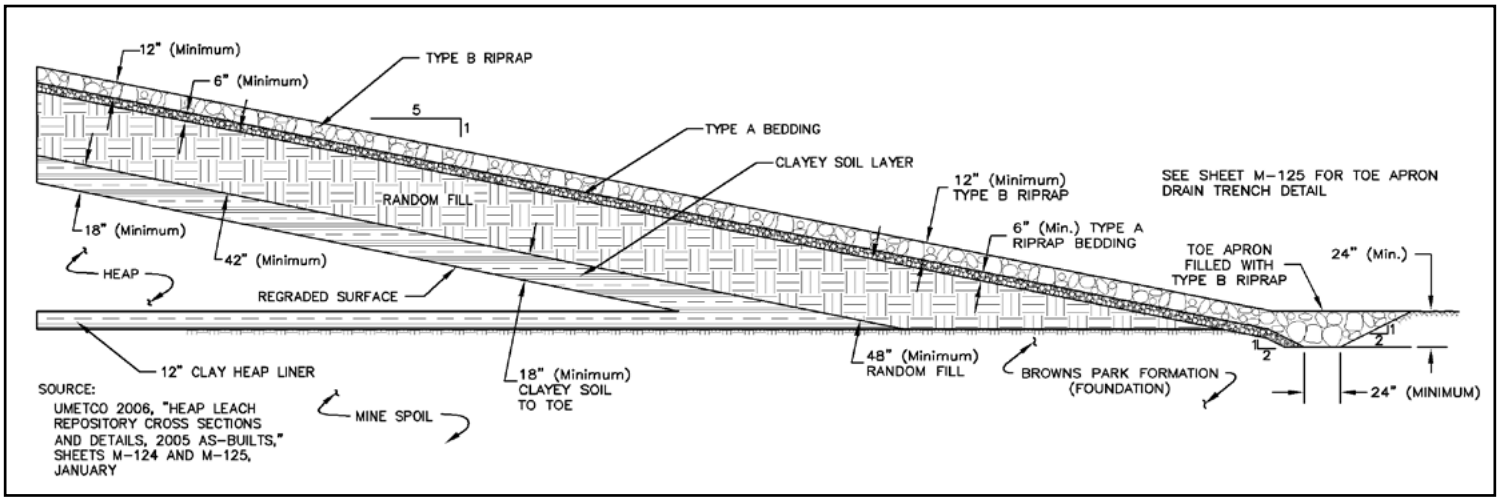
Umetco Minerals Corporation constructed and operated heap leach cells on the site from 1975 through 1982. During operations, low-grade uranium ore mined from local pits was placed into heap leach cells constructed from 35- to 55-foot-high berms. Sulfuric acid was used to leach the material to extract uranium minerals. Leachate was then collected by a drain system and piped to an adjacent plant for concentration. The plant consisted of a series of holding ponds where the leachate was either recycled to the heaps for upgrading or processed by ion exchange within the outdoor plant. Additional processing resulted in a uranium oxide precipitate that was sent offsite for final purification.

Processing operations ceased in 1982, but liquid waste management operations continued. Liquid waste was managed by evaporating the pond liquids and evaporating liquids from the surface of the heap leach cells. A spray evaporation system, installed to increase the efficiency of liquid waste disposal, operated from 1988 until 1994. In 1991, the sides and a portion of the top of the leached ore materials, or tailings pile, were regraded, and an interim revegetated cover was placed over the pile.

The heap leach materials, or tailings, are a predominantly sandy material with lesser amounts of finer-grained particles that remain after uranium is leached from the ore. The tailings contain radionuclides and metals that were naturally occurring in the ore.

Formal decommissioning and reclamation began in 1995 and were completed in 2005. A total of 1,975,000 tons of tailings are stabilized at the site. The main disposal cell consists of the former heap leach cells; a smaller ancillary cell contains materials from the evaporation pond and contaminated debris generated at the close of reclamation activities.

Groundwater sampling and analysis was performed at the site during uranium processing operations (1975 through 1982), post-operations waste management (1982 through 1994), and site reclamation (1995 through 2005). Comparison of analytical results from the background wells, the downgradient wells, and the chemical composition of the heap leachate indicated that leachate has not contaminated the site groundwater. On the basis of 30 years of monitoring with no indication of site-related contamination in groundwater, regulators determined that further groundwater monitoring was not required at the site.



Cross Section of the Maybell West Disposal Cell.

Regulatory Setting

Congress passed the Uranium Mill Tailings Radiation Control Act (UMTRCA) in 1978 (Public Law 95-604). The Maybell West site is under the jurisdiction of Title II of UMTRCA, which applies to uranium mill sites 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. Colorado declined to become the long-term custodian of the Maybell West site, and the U.S. Department of Energy (DOE) assumed custodial responsibility. Under Title II of UMTRCA, the licensee, Umetco Minerals Corporation, was responsible for reclamation. 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. In 2007, under agreement state authority, the state of Colorado determined that the reclaimed site met UMTRCA standards. NRC concurred in this finding and the site was included under NRC's general license for long-term custody in 2010. At that time, all lands transferred to DOE, whose Office of Legacy Management (LM) is responsible for post-closure custody and care.

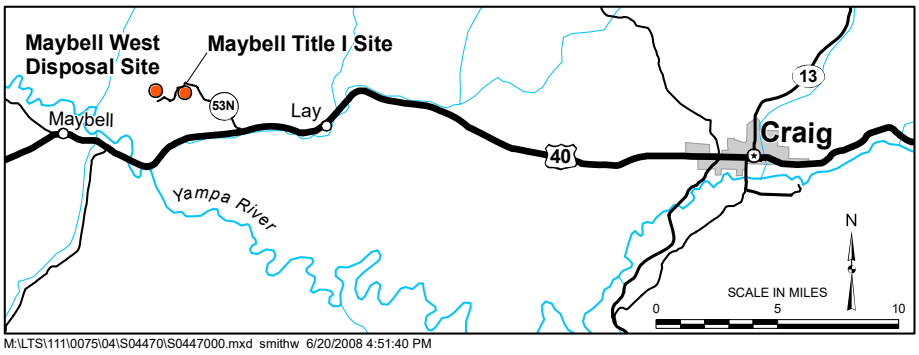
In accordance with 40 CFR 192.32, the disposal cell is designed to be effective for 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years. However, the general license has no expiration date, and LM's responsibility for the safety and integrity of the Maybell West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

Disposal Cell Design

Portions of the pile have been regraded, and an interim, 6-inch-thick cover was placed over the heap leach materials. Contaminated materials have been consolidated into an above-grade, stabilized-in-place embankment extending to a maximum height of 75 feet above the surface grade. A clay liner inhibits the discharge of contaminants to the subsurface. A clayey soil cover and random fill control radon emissions and infiltration of precipitation. Riprap armoring provides erosion protection from the encapsulated materials.

The ancillary cell was an existing heap drainage storage pond. Synthetic pond liner material, evaporation pond material, and other contaminated debris that remained onsite when reclamation activities were closed are isolated in this cell. The ancillary cell was covered with a minimum of 5.5 feet of cover, including radon barrier clay, random fill, and erosion protection material.

The disposal cells and associated systems have been designed and constructed to minimize the need for routine maintenance. The cover of the disposal cell is designed to shed precipitation to an armored outlet channel, which is further protected from head-cutting by a launch rock basin. The disposal site area is fenced to prevent damage from livestock grazing in the vicinity and to discourage trespassing. If an inspection of the site reveals that an as-built feature is failing or has degraded so that site protectiveness is compromised, repairs will be conducted to re-establish or surpass the durability of the as-built condition.



Regional Location of the Maybell West Disposal Site.

View from the Disposal Cell Looking South Toward the Ancillary Cell.

Legacy Management Activities

LM manages the Maybell West disposal site according to a site-specific Long-Term Surveillance Plan to ensure that the disposal cell system continues to prevent the release of contaminants into the environment.

Under provisions of this plan, LM conducts annual inspections of the site to evaluate the condition of surface features and performs site maintenance as necessary.

CONTACT INFORMATION

IN CASE OF AN EMERGENCY AT THE SITE, CONTACT 911

LM TOLL-FREE EMERGENCY HOTLINE: (877) 695-5322

Site-specific documents related to the **Maybell West, Colorado, Disposal Site** are available on the LM website at **www.energy.gov/lm/maybell-west-colorado-disposal-site**

For more information about LM activities at the **Maybell West, Colorado, Disposal Site**, contact:
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