14.0 Rifle, Colorado, Disposal Site

14.1 Compliance Summary

The Rifle, Colorado, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site was inspected on August 29, 2023. Minor depressions or undulations were noted on the disposal cell cover, particularly on the southeastern edge of the cell. These features will be verified with the light detection and ranging (lidar) data from the baseline aerial survey. No other changes were observed on the disposal cell. No changes were observed in the associated drainage features. Inspectors identified minor maintenance items that are listed in Section 14.6 but found no cause for a follow-up inspection.

Since 2001, the U.S. Department of Energy (DOE) has actively pumped pore water from the disposal cell into an evaporation pond to facilitate reduction of pore-water levels within the cell. Despite these efforts, pore water continues to accumulate, and water levels in the disposal cell are increasing. Three unplanned system shutdowns occurred since the 2022 annual site inspection that caused the elevation of the pore water within the disposal cell to rise above the elevation of the top of the disposal cell liner for short durations. To address these issues, DOE has initiated accelerated planning and associated actions to increase the extraction and management of pore water building up within the disposal cell.

14.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the site-specific Long-Term Surveillance Plan (DOE 1997) (LTSP) in accordance with procedures established to comply with the requirements of the U.S. Nuclear Regulatory Commission (NRC) general license at Title 10 *Code of Federal Regulations* Section 40.27 (10 CFR 40.27). Table 14-1 lists these requirements.

Table 14-1. License Requirements for the Rifle, Colorado, Disposal Site

Requirement	LTSP	This Report	10 CFR 40.27
Annual Inspection and Report	Section 3.0	Section 14.4	(b)(3)
Follow-Up Inspections	Section 3.4	Section 14.5	(b)(4)
Maintenance and Repairs	Section 4.0	Section 14.6	(b)(5)
Groundwater Monitoring	Section 2.6	Section 14.7	(b)(2)
Disposal Cell Pore-Water Level Monitoring	Appendix	Section 14.8	—
Corrective Action	Section 5.0	Section 14.9	—

14.3 Institutional Controls

The 205-acre site, identified by the property boundary shown in Figure 14-1, is owned by the United States and was accepted under the NRC general license in 1998. DOE is the licensee and, in accordance with the requirements for UMTRCA Title I sites, the Office of Legacy Management (LM) is responsible for the custody and long-term care of the site. Institutional controls (ICs) at the site include federal ownership of the property, administrative controls, and

the following physical ICs that are inspected annually: the disposal cell and associated drainage features, entrance gates and sign, stock fence, perimeter signs, site markers, survey and boundary monuments, standpipes, and evaporation pond.

14.4 Inspection Results

The site, 6 miles north of Rifle, Colorado, was inspected on August 29, 2023. The inspection was conducted by M. Franke, C. Mueller, K. MacDougall, N. Lind, and E. Gaasche of the Legacy Management Support (LMS) contractor. M. Young (LM), and A. Lawrence and M. Cosby (Colorado Department of Public Health and Environment) also attended the inspection. The purposes of the inspection were to confirm the integrity of visible features at the site, identify changes in conditions that might affect conformance with the LTSP, and evaluate whether maintenance or follow-up inspection and monitoring are needed.

14.4.1 Site Surveillance Features

Figure 14-1 shows the locations of site features, including site surveillance features and inspection areas, in black and gray font. Some site features that are present but not required to be inspected are shown in italic font. Observations from previous inspections that are currently monitored are shown in blue, and new observations identified during the 2023 annual inspection are shown in red. Inspection results and recommended maintenance activities associated with site surveillance features are described in the following subsections. Photographs to support specific observations are noted in the text and in Figure 14-1 by photograph location (PL) numbers. The photographs and photograph log are presented in Section 14.11.

14.4.1.1 Access Road, Entrance Gates, and Entrance Sign

Access to the site is from an improved gravel road northeast of Colorado Highway 13. A perpetual right-of-way across U.S. Bureau of Land Management (BLM) property provides access to the site. Entrance to the site is through two locked gates on the access road: an outer reinforced metal gate about 1700 feet (ft) south of the site and an inner metal gate at the stock fence. The entrance sign, which is next to the inner gate, was faded and had minor cracks but remained legible (PL-1). The BLM section of the access road had several gullies approximately 6 to 12 inches deep, across and along the access road, from a precipitation event 5 days before the inspection that produced more than 1 inch of rain (PL-2). The access road was repaired following the inspection. No other maintenance needs were identified.

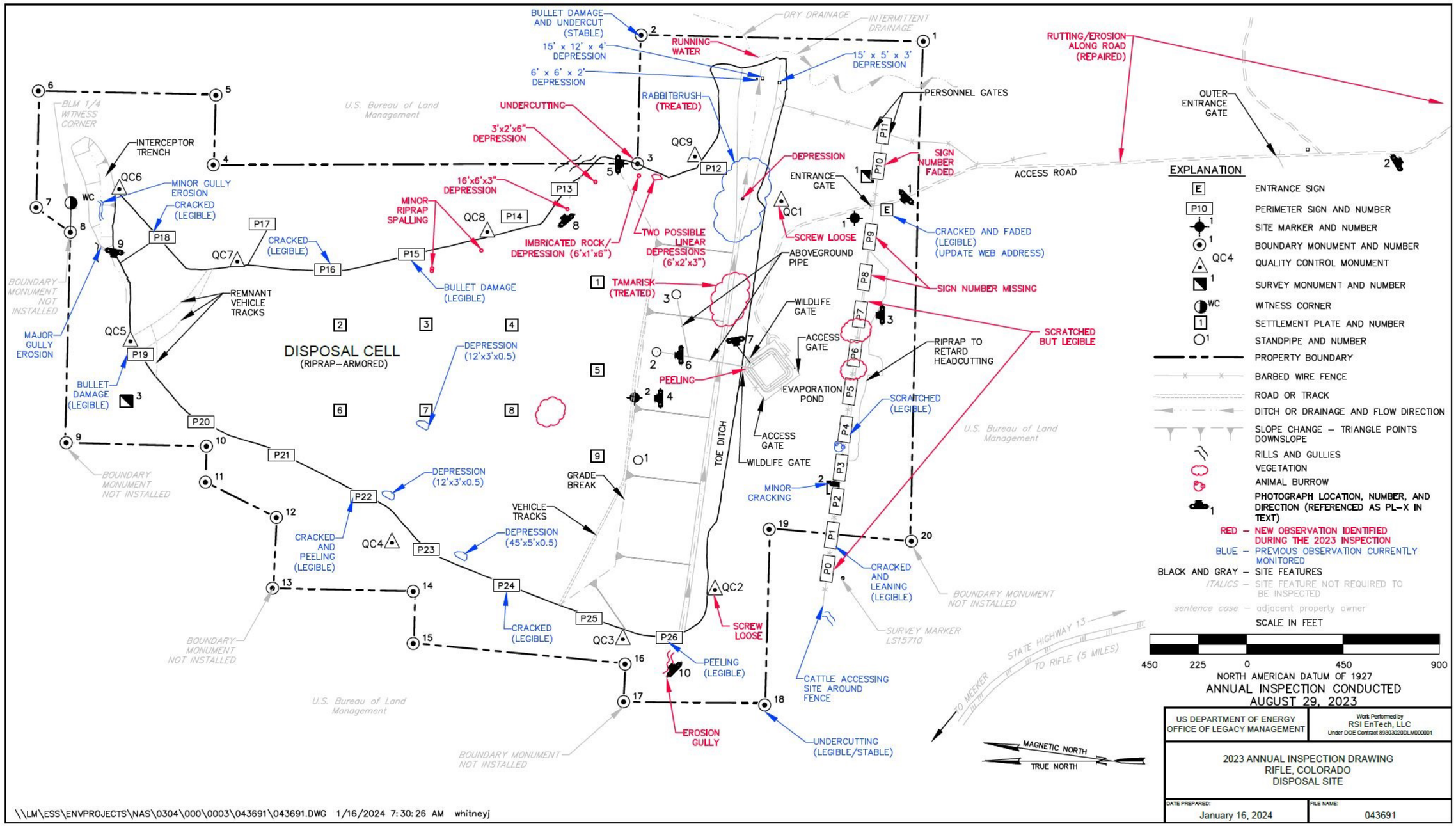


Figure 14-1. 2023 Annual Inspection Drawing for the Rifle, Colorado, Disposal Site

14.4.1.1 Stock Fence and Perimeter Signs

A four-strand barbed-wire stock fence at the southern end of the site extends to the edge of steep-sided arroyos that bound the site on the east and west. In previous years, livestock associated with an adjacent BLM grazing allotment would go around the fence to graze on the site vegetation. Inspectors noticed little to no evidence of continued livestock grazing during the 2023 inspection. This is discussed further in Section 14.4.2.3. Two barbed-wire personnel gates are at the southeast corner of the site. No maintenance needs were identified.

There are 27 perimeter signs positioned along the site perimeter. Perimeter signs P0 through P11 are attached to the stock fence, and perimeter signs P12 through P26 are attached to steel posts set in concrete and set back 5 ft from the boundary. Perimeter signs P15 and P19 have bullet damage but remain legible. Perimeter signs P1, P16, P18, P22, P24, and P26 have minor cracks and are peeling but remain legible. The sign number on perimeter sign P10 is faded, and the sign numbers on perimeter signs P8 and P9 are missing. Perimeter signs P0 through P7 are scratched but legible (PL-3). No maintenance needs were identified.

14.4.1.2 Site Markers

The site has two granite site markers. Site marker SMK-1 is just inside the inner entrance gate, and site marker SMK-2 is on the top slope of the disposal cell (PL-4). No maintenance needs were identified.

14.4.1.3 Survey and Boundary Monuments

Three survey monuments and 15 boundary monuments delineate the property boundary. The boundary monuments are set at the corners of the irregular site boundary. Although the site boundary has 20 corners, only 15 are marked by boundary monuments because five of the corners are on extremely steep terrain that is not safely accessible. Consequently, boundary monuments BM-8, BM-9, BM-13, BM-17, and BM-20 were never installed. GPS is used to identify and inspect existing boundary monuments that are in hard-to-access areas. Boundary monument BM-2 has several bullet holes but remains intact. Boundary monuments BM-2 and BM-3 have undercutting at the ground surface but remain stable (PL-5). Boundary monument BM-18 was previously reported to have undercutting, but it was not inspected during the 2023 inspection because it was too difficult to access. Survey monument SM-2 has slight cracking in the concrete, but the cracking does not affect the integrity of the survey monument. No maintenance needs were identified.

14.4.1.4 Aerial Survey Quality Control Monuments

Nine aerial survey quality control monuments were inspected during the 2023 annual inspection. No maintenance needs were identified.

14.4.1.5 Standpipes

Three 18-inch diameter standpipes (referred to here as MW01, MW02, and MW03) on the south side slope of the disposal cell are used to monitor pore-water levels in the disposal cell.[1] At the time of the inspection, disposal cell pore water was being pumped from standpipes MW02 (PL-6) and MW03 into the evaporation pond. A third standpipe, MW01, is currently dry and not part of the leachate removal system.

No routine maintenance needs were identified for the standpipes. However, in conjunction with the disposal cell pore-water level monitoring efforts (Section 14.8), the surface components for standpipes MW02 and MW03 were modified following the inspection by installing protective vaults over the standpipes and burial of the pipeline that transmits water to the evaporation pond.

14.4.1.6 Evaporation Pond

A lined evaporation pond was constructed adjacent to the disposal cell in 2001 to receive water pumped from standpipes MW02 and MW03. The pond contained water at the time of the inspection. Evaluation of the pond liner's integrity was completed in fall 2020 by a professional geosynthetic liner installation and inspection company. Two minor holes, approximately 2 inches in diameter, were identified at the top slope of the liner and repaired in May 2021. Inspectors noted that one of the patches placed on the top 1 foot of the pond liner in May 2021 was peeling on the top 1 foot of the liner near the northern corner of the evaporation pond (PL-7). LM plans to replace the pond liner in fiscal year (FY) 2025, barring further damage that would necessitate earlier replacement.

At the time of the 2023 inspection, the security fence around the pond was intact and effectively preventing livestock from entering the area. The vehicular access gates on the northern and western corners of the fence were closed and locked at the time of the inspection. A meteorological station alongside the pond was functioning normally. No other maintenance needs were identified.

14.4.2 Inspection Areas

In accordance with the LTSP, the site is divided into four areas to ensure a thorough and efficient inspection. The inspection areas are (1) the disposal cell and interceptor trench, (2) the toe ditch and toe ditch outlet, (3) onsite reclaimed areas, and (4) the outlying area. Inspectors examined specific site surveillance features within each area and looked for evidence of settlement, erosion, or other modifying processes that might affect the site's conformance with LTSP requirements.

[1] Previous annual reports (e.g., DOE 2023a) referred to the standpipes using an "SP-" prefix (e.g., SP-01, SP-02, and SP-03). Because these locations are designated as MW01, MW02, and MW03 in LM's authoritative database (https://gems.lm.doe.gov/#site=RFLhttps://gems.lm.doe.gov/#site=RFL), they are referred to as such in the remainder of this report.

14.4.2.1 Disposal Cell and Interceptor Trench

The disposal cell, completed in 1996, occupies 71 acres and is armored with riprap consisting of river cobbles and boulders to control erosion and deter animal and human intrusion. During the 2023 inspection, inspectors noted four depressions on the southeast side of the top of the cell. The largest was approximately 16 ft × 6 ft × 3 inches (PL-8). There was no other evidence of erosion, settling, slumping, or other modifying processes that might affect the integrity of the disposal cell. As in the past several inspections, inspectors noticed minor rock degradation on the disposal cell top slope, primarily in the form of cracking and spalling. Rock degradation is not currently a concern.

Remnant vehicle tracks, which formed on the cover during well decommissioning activities in 2002, remain evident in the northern portion of the disposal cell. Additional vehicle tracks continue to be visible in the southern portion of the disposal cell, which are attributable to the installation of solar panels and pumps at standpipes MW02 and MW03.

Tamarisk was noted in the toe ditch and was treated following the inspection. Small, isolated patches of other grasses also were present on the disposal cell cover and side slope, but they do not present a concern and do not require treatment.

A vegetated interceptor trench was constructed at the top of the disposal cell to protect it from stormwater and snowmelt runoff (PL-9). The trench appeared to be functioning as designed, although minor gully erosion has been occurring in the lower portion of the trench. The gully did not appear to be increasing significantly in depth or width. In the outfall area below the trench (down the steep-sided natural slope), stormwater runoff has formed a major gully to the north of the armoring riprap. The gully did not appear to be increasing in depth or width during the 2023 inspection. The outfall area will continue to be monitored to assess if additional riprap is needed on the slope to prevent upstream gully migration. No maintenance needs were identified.

14.4.2.2 Toe Ditch and Toe Ditch Outlet

A toe ditch runs along the downslope (southern) edge of the disposal cell and is armored with the same rock that protects the disposal cell. The toe ditch diverts stormwater runoff from the disposal cell offsite to the east. The ditch was stable and functioning as designed. At the time of the inspection, water was running from the toe ditch.

Minor erosion, anticipated in the design, remains evident in the channel at the toe ditch outlet. Rock previously placed in the outlet to stabilize the erosion has dropped into and armored the eroded areas. Inspectors found two depressions in the rock during the 2017 annual inspection (one about 15 × 12 ft in area and 4 ft deep and one about 6 × 6 ft in area and 2 ft deep) and another depression during the 2018 annual inspection (about 15 × 5 ft in area and 3 ft deep). These depressions were formed near the outlet of the toe ditch on the east end after the underlying soil eroded away. A fourth depression was noted in the toe ditch near quality control monument QC-1 during the 2023 annual site inspection. They are not a concern at this time but will continue to be monitored. No maintenance needs were identified.

14.4.2.3 Onsite Reclaimed Areas

Disturbed areas around the edges and south of the disposal cell were reseeded in 1996 and, overall, have been successfully reclaimed. Before 2012, there was little evidence of grazing within the site boundaries. Since 2012, however, cattle grazing has been regularly observed, and cattle trails have been identified meandering up the steep arroyos on the unfenced, southwest side of the site. There was little to no evidence of cattle grazing observed during the 2023 inspection. LM is evaluating additional fencing installation options on the southwest side of the site to prevent cattle access. Animals are burrowing under the fence between perimeter signs P3 and P4. Inspectors will continue to monitor this area and conduct repairs when necessary.

Three arroyos are present in the reclaimed area south of the disposal cell and outside the stock fence. A rock apron was placed between the stock fence and the headcuts in these arroyos to prevent headward migration toward the disposal cell. As erosion has migrated into the rock apron, the rock has naturally armored the arroyos and effectively stabilized them from further erosion. Inspectors will continue to monitor this area. No maintenance needs were identified.

A small gully has formed adjacent to the disposal cell near perimeter sign P26 (PL-10). It will continue to be monitored.

14.4.2.4 Outlying Area

The 0.25-mile area beyond the site boundary was visually observed for erosion, changes in land use, or other phenomena that might affect the long-term integrity of the site. The primary land uses in the area are grazing, hunting, recreation, and wildlife habitat. The Rifle Arch Trailhead is approximately 0.25 mile southwest of the site along Highway 13. The City of Rifle constructed two additional mountain biking trails in spring 2021 that follow the Rifle Arch Trail. Historically, trash has been dumped along the access road between Highway 13 and the outer entrance gate, and BLM has periodically removed it. No other changes to the outlying area were observed.

14.5 Follow-Up Inspections

LM will conduct follow-up inspections if (1) a condition is identified during the annual inspection or other site visit that requires a return to the site to evaluate the condition or (2) LM is notified by a citizen or outside agency that conditions at the site are substantially changed. No need for a follow-up inspection was identified.

14.6 Maintenance and Repairs

Treatment of rabbitbrush growing on the top of the disposal cell was completed before the 2023 inspection.

Inspectors noted the following maintenance items that were completed following the 2023 inspection:

- Treating the tamarisk growing in the toe drain
- Repairing the access road

Inspectors identified the following maintenance items that will be completed before the next inspection:

- Updating the website address on the entrance sign

14.7 Groundwater Monitoring

Groundwater quality monitoring is not required by the LTSP (DOE 1997). Transient drainage from the disposal cell enters the Wasatch Formation, a 3800-foot-thick sequence of shales, siltstones, and fine-grained sandstones (DOE 1997). The Wasatch Formation separates the disposal cell from the uppermost useable aquifer (the Mesaverde Group). Groundwater in the Wasatch Formation is classified as limited use due to naturally occurring concentrations of total dissolved solids that exceed 10,000 milligrams per liter (DOE 1997). Additionally, this unit produces very little water and is not considered to be an aquifer. Based on data from 1998–1992, background levels of barium, cadmium, chromium, molybdenum, and selenium exceed corresponding U.S. Environmental Protection Agency maximum concentration limits. The LTSP concluded that no further groundwater monitoring is required at the site because (1) the Wasatch Formation does not represent a useable source of water and (2) no exposure pathways to site-related groundwater exist at the site (DOE 1997). Therefore, all monitoring wells at the site were decommissioned by 2002.

14.8 Disposal Cell Pore-Water Level Monitoring

In accordance with the LTSP, LM monitors pore-water levels in the disposal cell at standpipes MW02 and MW03, which are installed at the downgradient end of the disposal cell on the south side slope (Figure 14-1). This monitoring is conducted in conjunction with extraction to maintain water levels below the high-density polyethylene (HDPE) liner that was installed in the toe of the disposal cell at an elevation of 6022.50 ft during original construction.[2] The bottom of standpipe MW01 is at an elevation of 6023.95 ft; as such, it continues to be dry and does not require continuous monitoring.

A contingency plan for control of pore-water levels at the toe of the disposal cell was included as an attachment to the LTSP (DOE 1997). The plan included the installation of a dewatering system and a retention pond to use when water levels reach an elevation of 6016.5 ft and the solar-powered dewatering pump is initiated at a water level elevation of 6018.5 ft. Both the dewatering system and the evaporation pond were constructed in 2001. Water pumped from the standpipes was discharged through an aboveground polyethylene pipe to the evaporation pond. In November 2023, new discharge pipelines were installed and buried in the disposal cell frost barrier to protect against freezing. The disposal cell dewatering system (pump) is activated when the interior pore-water elevation reaches 6018.5 ft.

[2] All elevation data presented in this section are referenced to the North American Vertical Datum of 1988 (NAVD 88). In January 2021, the site's vertical datum was transformed from National Geodetic Vertical Datum of 1929 (NGVD 29) to NAVD 88. The transformation resulted in an approximate increase of 2.53 ft in elevation measurements across the site relative to the original NGVD 29 datum.

Unplanned system shutdowns of the pumping system have occurred for various reasons, including: (1) periods when solar-powered pumps are nonoperational (for recovery tests or maintenance) or (2) when temperatures are below freezing, preventing the pump from operating. Recent unplanned system shutdowns (occurring since the 2022 annual site inspection) are addressed later in this section.

Table 14-2 lists the total annual dewatering volumes based on the flow meter at the evaporation pond for 2008–2023. Figure 14-2 plots the same data along with corresponding cumulative volumes, accounting for previous (1993–2008) leachate extraction volumes (DOE 2009). The current cumulative dewatering volume (through early November 2023) is approximately 7.2 million gallons.

Figure 14-3 plots historical pore-water elevations in standpipes MW02 and MW03 and corresponding dewatering rates. The 6018.5 ft pump action level was first exceeded between 2001 and 2003, after which elevations declined. Starting in approximately 2012, water elevations in both standpipes began steadily increasing and the pump action level was again exceeded in 2016 (Figure 14-3). After an approximate 12-year shutdown, pumping at MW02 resumed in 2018. In response to the increasing water elevations, in 2019, LM began nearly continuous dewatering, a shift from the previous seasonal pumping regime evident in Figure 14-3.

Before spring 2021, the pore-water levels were monitored during monthly pump shutdown periods, which allowed the water levels to equilibrate between the standpipes and the surrounding media. In 2022, the monthly recovery tests ceased due to concerns that the liner would be overtopped during the recurring shutdown periods. Since then, pumps have been operating continuously with few exceptions. Because of the fairly continuous drawdown, measured water levels only represent the bottom of each well's cone of depression, and the ambient water level within the tailings is unknown.

In March 2021, the solar-powered pumping system was upgraded to provide additional operation of the pumps by increasing electrical storage ability. By adding batteries to store solar-generated electricity, the pumps can operate throughout the night and on overcast days. To allow the pumping system to function at colder temperatures in the winter, in July 2022, the leachate discharge pipes were replaced with 2-inch-diameter pipes and insulated where the pipe crosses the toe ditch to protect against freezing and pipe bursting. These upgrades resulted in an increase in annual dewatering volumes (Table 14-2) but do not appear to have decreased the pore-water level in the disposal cell. In fact, despite increased pumping, the maximum water level in both standpipes continues to rise (Figure 14-3).

Table 14-2. Total Dewatering Volumes at the Rifle, Colorado, Disposal Site, 2008–2023

Reporting Year[a]	Annual Dewatering Volumes (gal)[b]	Daily Average Dewatering Rate (gal per day)[c]	Days Pumping[d]	Cumulative Dewatering Volumes (gal)[e]
2008	143,078	708	139	143,078
2009	389,601	1070	159	532,680
2010	215,345	590	134	748,025
2011	61,331	169	66	809,355
2012	155,189	424	128	964,544
2013	106,266	291	107	1,070,810
2014	138,571	380	139	1,209,381
2015	154,621	424	149	1,364,002
2016	168,515	460	183	1,532,516
2017	87,741	240	101	1,620,258
2018	121,538	340	155	1,741,796
2019[f]	246,970	684	336	1,988,766
2020	194,711	532	332	2,183,477
2021	296,836	813	339	2,480,313
2022	255,209	699	322	2,735,522
2023	225,430	723	309	2,960,952

Notes:

[a] Data from June 13, 2008, (start of continuous flow measurements) through November 8, 2023, when the pond flow meter malfunctioned and other maintenance needs were identified (Young 2023b).

[b] Annual dewatering volumes based on flow readings registered at the evaporation pond flow meter. As acknowledged in the previous annual report (DOE 2023a), these readings are considered more accurate than those measured at standpipes MW02 and MW03. For some years, annual and cumulative volumes reported here differ from those documented in previous annual reports because of retroactive corrections to data retrieved from the System Operation and Analysis at Remote Sites (SOARS)/AQUARIUS database. In most cases, these differences are negligible (≤±1%), except for volumes reported for 2009 (−4.4%), 2014 (+2.6%), and 2017 (+1.9%).

[c] Daily average dewatering rates were calculated by dividing annual dewatering volumes by the corresponding number of records (357–366 depending on year). Exceptions apply to 2008 (divisor of 202 given start date of June 13, 2008) and 2023 (divisor of 312 given end date of November 8, 2023).

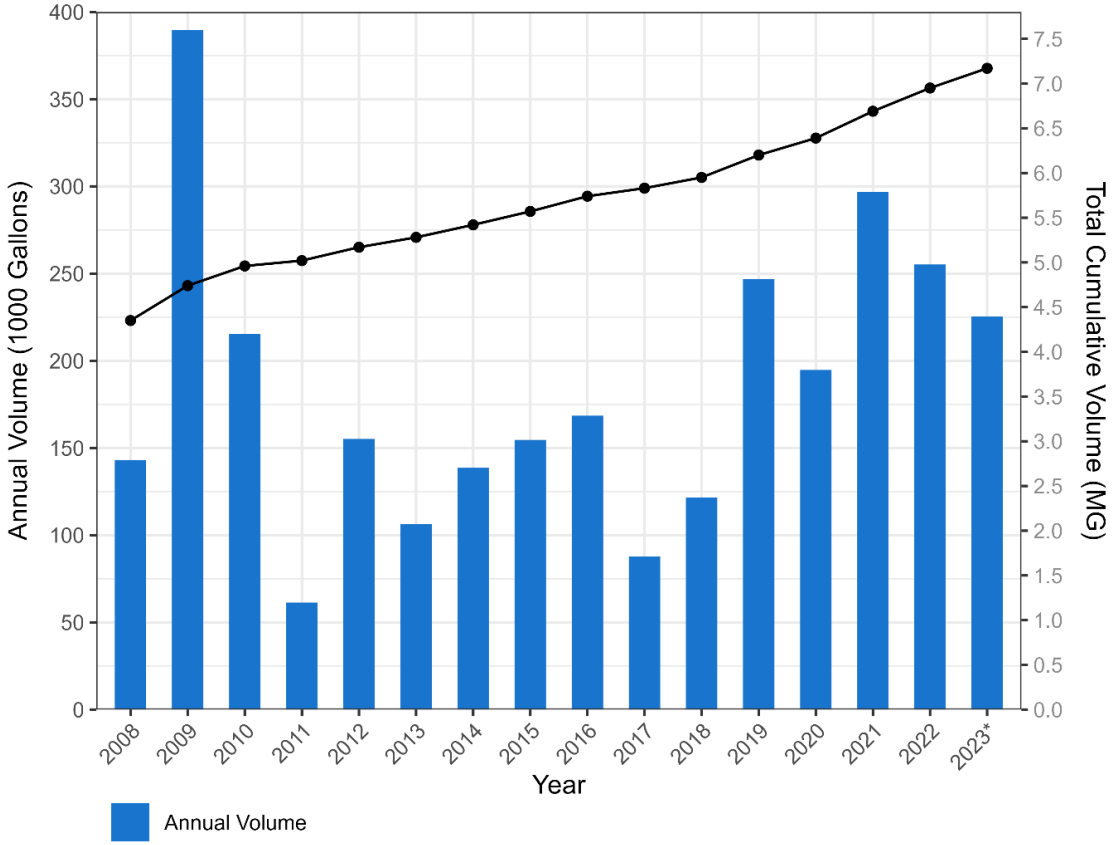
[d] Entries in this column (days pumping) correspond to the number of days with daily flow volumes greater than zero.

[e] Cumulative volumes correspond to the 2008–2023 time frame and do not account for historical volumes. The total measured volume of leachate extracted from the standpipes through 2008 was approximately 4.35 million gallons (DOE 2009).

[f] Continuous pumping began in 2019, a shift from the previous seasonal pumping regime.

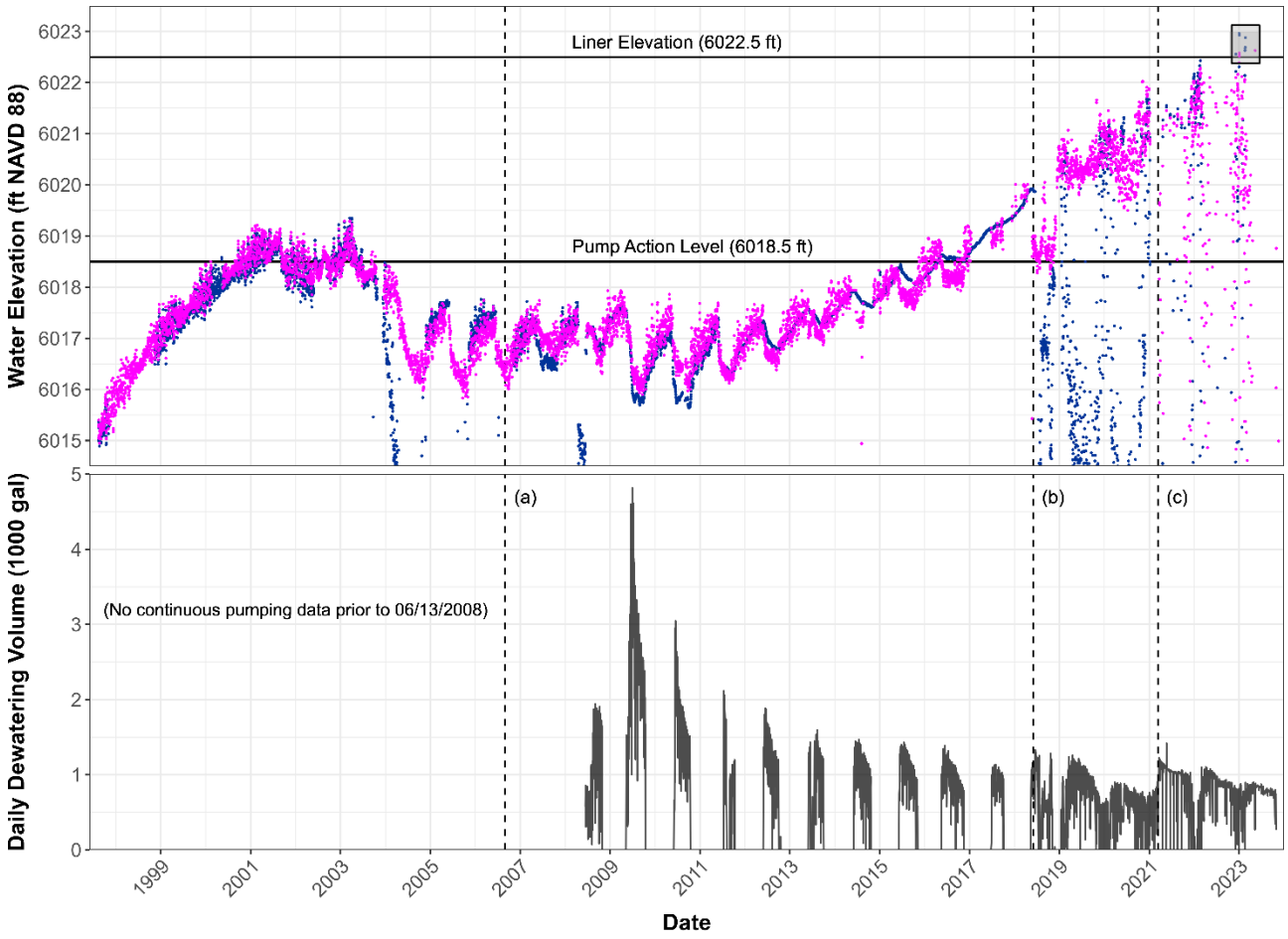
Abbreviation:

gal = gallons



Notes: Annual volumes from Table 14-2; data from June 13, 2008, through November 8, 2023. Cumulative volumes based on the 2008 annual inspection report (DOE 2009), which stated that the total measured volume of leachate extracted from the standpipes through 2008 was approximately 4.35 million gallons.
Abbreviation: MG = million gallons

Figure 14-2. Annual and Cumulative Volumes of Leachate Removed from the Rifle Disposal Cell, 2008–2023



- MW02 daily maximum water elevation
- MW03 daily maximum water elevation
- - - Denotes changes in system operations:
  - (a) MW02 pumping stopped – 9/1/2006
  - (b) MW02 pumping resumed – 6/15/2018
  - (c) Collection system upgrades – 3/12/2021
- —— Daily dewatering volume (from evaporation pond flow meter)
- Period when pore-water elevations exceeded the top of liner elevation (zoom view shown in Figure 14-4)

Notes: Water elevations shown in the upper portion of this figure are referenced to vertical datum NAVD 88 and represent daily maximum elevations filtered from 5-minute data. The upper surface of all data points is the closest representation of static pore-water level conditions, with drawdown associated with pumping periods. Pumping has been continuous since mid-2018, resulting in sustained drawdown in MW02 and MW03.

The *y*-axis lower limit in the uppermost plot is clipped at 6014.5 ft to focus on the data trend most representative of static (nonpumping) conditions. Therefore, the full extent of the daily maximum data subset (accounting for drawdown) is not reflected here. Examples include the following periods:

- December 2003 through June 15, 2008, when daily maximum elevations in standpipe MW02 ranged from 6008–6009 ft (NAVD 88)
- 2021–2023, when daily maximum elevations in standpipes MW02 and MW03 were as low as 6001–6002 ft in MW02 and 6006 ft in MW03 due to continued drawdown.

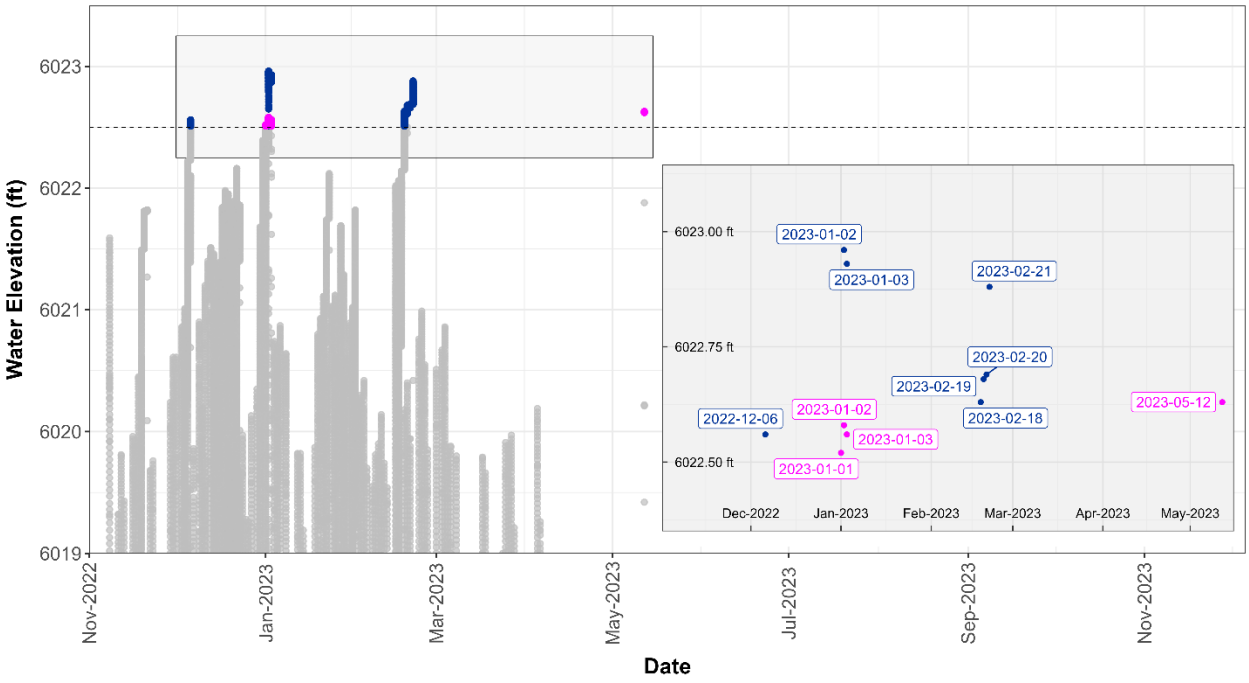
Abbreviation: gal = gallons

Figure 14-3. Disposal Cell Pore-Water Elevations in Standpipes MW02 and MW03 and Corresponding Dewatering Rates at the Rifle, Colorado, Disposal Site, 1997–2023

Three unplanned system shutdowns occurred since the 2022 annual site inspection that caused the elevation of the pore water within the disposal cell to rise above the elevation of the top of the HDPE liner for short durations. A zoom view of these exceedances, showing only pore-water elevation measurements exceeding 6020.5 ft, is provided in Figure 14-4. These shutdowns are documented in the *Preliminary Assessment Report for Unplanned Pumping System Shutdown and Subsequent Pore-Water Level Rise Within the Rifle, Colorado, Disposal Site* (Young 2023a) and summarized below.

- December 6, 2022: The pore-water level in standpipe MW02 rose to an elevation of 6022.56 ft, the first documented exceedance of the top of liner elevation.
- January 1–3, 2023: Pore-water levels in standpipes MW02 and MW03 rose to maximum elevations of 6022.96 (maximum recorded elevation) and 6022.58 ft, respectively.
- May 12, 2023: The pore-water elevation in MW02 rose to 6022.63 ft.

In addition to the unplanned system shutdowns noted above, exceedances of the top of liner elevation also occurred for a brief period in February 2023 (February 18–21), associated with apparent malfunctions of the MW02 pump and flowmeter. During this period, water elevations in MW02 rose temporarily to levels ranging from 6022.63 to 6022.88 ft (Figure 14-4).



- MW02 water elevation > 6020.5 ft
- MW03 water elevation > 6020.5 ft
- Water elevation in either standpipe ≤ 6020.5 ft

Notes: Water elevations are referenced to vertical datum NAVD 88. Unlike the presentation in Figure 14-3, which shows only the daily maximum recorded elevation, this figure shows all exceedances of the 6020.5 ft top of liner elevation recorded in standpipes MW02 and MW03.

Figure 14-4. Zoom View of Pore-Water Elevations Exceeding the Top of Liner Elevation, December 2022 Through May 2023

In March 2022, LM completed a collaborative initiative with the National Laboratory Network (NLN) to identify innovative approaches to perform pore-water source investigation and accumulation mitigation strategies for the site. LM included NRC in the LM and NLN collaborative process. These efforts culminated in the development of the *Work Plan Disposal Cell Pore-Water Sources Investigation for the Rifle, Colorado, Disposal Site* (DOE 2023b). This work plan documents LM's approach for addressing the following three data quality objectives:

1. Update the disposal cell conceptual site model
2. Evaluate potential impacts associated with rising fluid levels within the disposal cell
3. Identify potential short-term, mid-term, and long-term solutions for pore-water source mitigation and accumulation within the disposal cell

14.9 Corrective Action

Corrective action is taken to correct out-of-compliance or hazardous conditions that create a potential health and safety problem or that may affect the integrity of the disposal cell or compliance with 40 CFR 192.

To address the continued rise in pore-water levels, DOE has initiated planning to increase the extraction and pore-water handling capacity to dewater the disposal cell. This will include optimization of the existing pumping infrastructure and installation of additional extraction wells, power, and evaporation capacity. DOE plans to complete the work in FY 2024.

14.10 References

10 CFR 40.27. U.S. Nuclear Regulatory Commission, "General License for Custody and Long-Term Care of Residual Radioactive Material Disposal Sites," *Code of Federal Regulations*.

40 CFR 192. U.S. Environmental Protection Agency, "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings," *Code of Federal Regulations*.

DOE (U.S. Department of Energy), 1997. *Long-Term Surveillance Plan for the Estes Gulch Disposal Site Near Rifle, Colorado*, DOE/AL/62350-235, Rev. 1, November.

DOE (U.S. Department of Energy), 2023a. *2022 Annual Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title I Disposal Sites*, LMS/S38159, Office of Legacy Management, March.

DOE (U.S. Department of Energy), 2023b. *Work Plan Disposal Cell Pore-Water Sources Investigation for the Rifle, Colorado, Disposal Site*, LMS/RFL/S32856, Office of Legacy Management, June.

Young, M., 2023a. M. Young, Office of Legacy Management, U.S. Department of Energy, letter (about the *Preliminary Assessment Report for Unplanned Pumping System Shutdown and Subsequent Pore-Water Level Rise Within the Rifle, Colorado, Disposal Site*) to K. Hayes, U.S. Nuclear Regulatory Commission, June 27.

Young, M., 2023b. M. Young, Office of Legacy Management, U.S. Department of Energy, letter (about the *Preliminary Assessment Report for Pore Water Discharge onto the Rifle, Colorado, Disposal Site*) to K. Hayes, U.S. Nuclear Regulatory Commission, November 8.

14.11 Photographs

Photograph Location Number	Azimuth	Photograph Description
PL-1	315	Entrance Sign, Cracked and Faded but Legible
PL-2	150	Rutting and Erosion Along Access Road
PL-3	0	Perimeter Sign P7, Scratched but Legible
PL-4	—	Site Marker SMK-2
PL-5	180	Boundary Monument BM-3 with Concrete Base Undercutting
PL-6	0	Standpipe MW02
PL-7	260	Evaporation Pond Liner with Repair Patch on Northern Corner
PL-8	50	Depression on Top Slope in Southeast Area of Disposal Cell
PL-9	280	Gully at Toe of Interceptor Trench
PL-10	44	Erosion near Perimeter Sign P26

Note:
— = Photograph taken vertically from above.

PL-1. Entrance Sign, Cracked and Faded but Legible

PL-2. Rutting and Erosion Along Access Road

PL-3. Perimeter Sign P7, Scratched but Legible

PL-4. Site Marker SMK-2

PL-5. Boundary Monument BM-3 with Concrete Base Undercutting

PL-6. Standpipe MW02

PL-7. Evaporation Pond Liner with Repair Patch on Northern Corner

PL-8. Depression on Top Slope in Southeast Area of Disposal Cell

PL-9. Gully at Toe of Interceptor Trench

PL-10. Erosion near Perimeter Sign P26