

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 June 30, 2015. The disposal cell and all associated surface-water diversion and drainage structures were in good condition and functioning as designed. Vegetation on the site was in excellent condition. Minor fence repairs and perimeter sign maintenance will be conducted prior to the next inspection.

Pore water continues to be pumped from the disposal cell into a lined evaporation pond to maintain the cell water level below the action level of 6,016 feet above mean sea level. The evaporation pond liner was inspected and repaired in early 2014, and it was in good condition at the time of the inspection. Inspectors identified no other maintenance needs or cause for a follow-up inspection.

14.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the *Long-Term Surveillance Plan for the Estes Gulch Disposal Site near Rifle, Colorado* (LTSP) (DOE/AL/62350-235, Rev. 1, U.S. Department of Energy [DOE], November 1997) and in procedures that DOE established to comply with the requirements of 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 Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 3.0	Section 14.4
Follow-Up Inspections	Section 3.4	Section 14.5
Maintenance and Repairs	Section 4.0	Section 14.6
Groundwater Monitoring	Section 2.6	Section 14.7
Cell Pore-Water-Level Monitoring	Appendix	Section 14.8
Corrective Action	Section 5.0	Section 14.9

14.3 Institutional Controls

The 205-acre disposal site (Figure 14-1) is owned by the United States of America and was accepted under the U.S. Nuclear Regulatory Commission general license (10 CFR 40.27) in 1998. The site is managed in accordance with requirements for UMTRCA Title I sites. DOE, as the licensee, is responsible for the site's custody and long-term care. Institutional controls at the site include federal ownership of the property and the following physical features that are inspected annually: access-control fencing, perimeter warning signs along the disposal cell boundary, and a locked gate at the entrance to the site.

14.4 Inspection Results

The site, north of Rifle, Colorado, was inspected on June 30, 2015. The inspection was conducted by R. Dayvault and S. Woods of the DOE Legacy Management Support contractor. R. Bush (DOE Site Manager), M. Cosby (Colorado Department of Public Health and Environment), and R. Evans (U.S. Nuclear Regulatory Commission) attended the inspection.

The purposes of the inspection were to confirm the integrity of visible features at the site, to identify changes in conditions that might affect site integrity, and to determine the need, if any, for maintenance or additional inspections and monitoring. Numbers in the left margin of this report refer to items summarized in Table ES-1 of the “Executive Summary.”

14.4.1 Site Surveillance Features

Figure 14-1 shows the locations of site surveillance features. Inspection results and recommended maintenance activities associated with site surveillance features are included in the following subsections. Photographs to support specific observations are identified in the text and on Figure 14-1 by photograph location (PL) numbers.

14.4.1.1 Access Road, Entrance Gates, and Entrance Sign

The site is accessed by driving northwest from Rifle for 5 miles on State Highway 13 and turning northeast on an improved gravel road. A perpetual right-of-way across U.S. Bureau of Land Management property provides access to the site. Two locked gates are present on the access road: a reinforced tubular metal gate about 1,700 feet south of the site that limits public access to the site area, and a tubular metal gate at the site fence. The access road, entrance gates, and entrance sign were in good condition.

14.4.1.2 Perimeter Fence and Perimeter Signs

A barbed-wire fence, located at the south end of the site, extends to the edge of steep-sided arroyos that bound the site on the east and west and acts as a deterrent for easy access to the site. Fence damage was observed during the 2015 inspection including broken barbed wire (PL-1). Barbed-wire personnel gates at the southeast corner of the site were closed, which is a change from previous inspections where the gates have been found open (PL-2).

Perimeter signs are positioned along the fence and the edge of the disposal cell. A few signs have bullet damage but all were legible. The small-hole hardware used on perimeter sign P4 will be replaced (PL-3).

14.4.1.3 Site Markers

Two granite site markers, one just inside and left of the entrance gate (SMK-1; PL-4) and the other on the disposal cell (SMK-2), were in good condition.

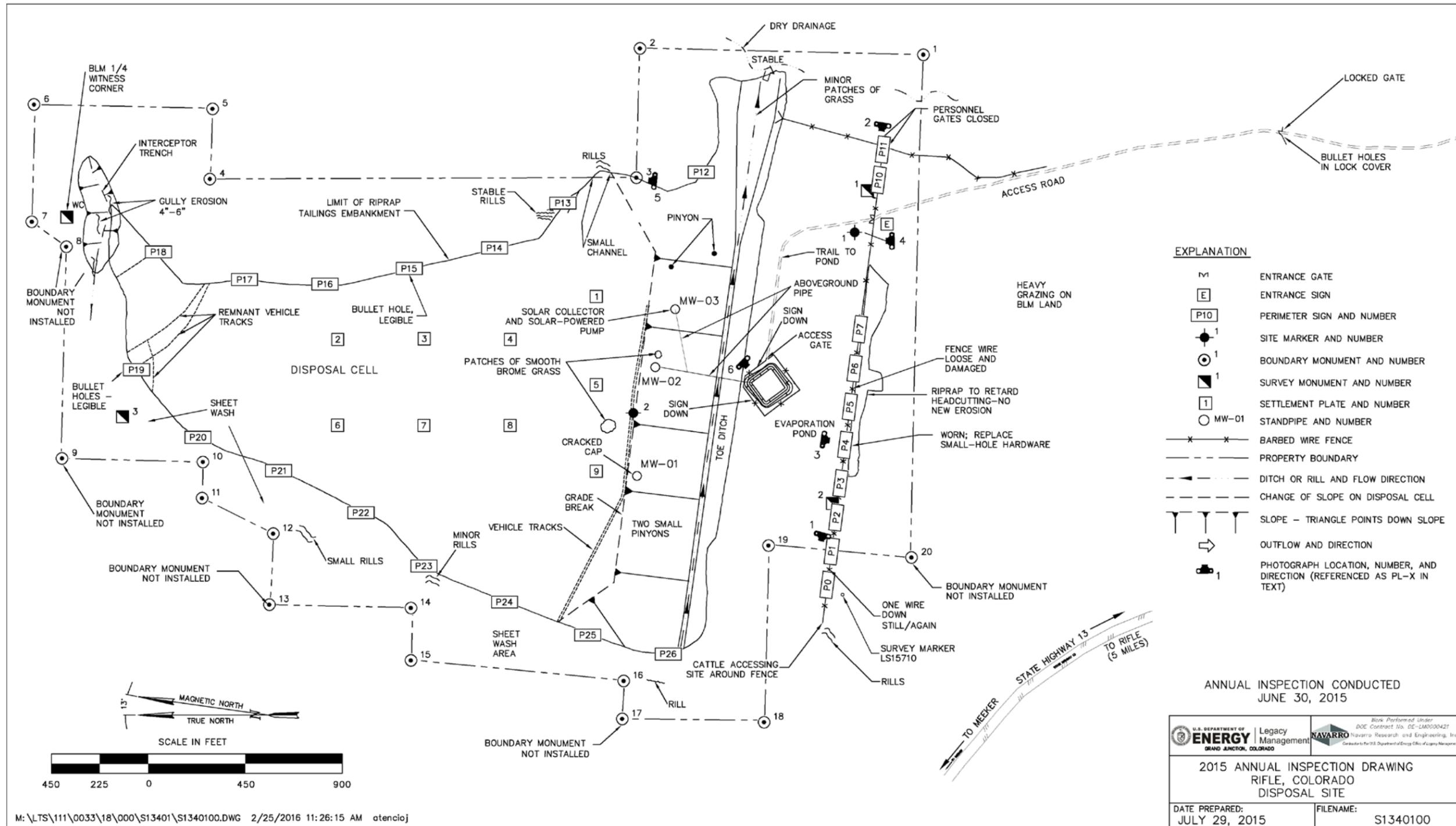


Figure 14-1. 2015 Annual Inspection Drawing for the Rifle Disposal Site

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14.4.1.4 Survey Monuments and Boundary Monuments

Three survey monuments and 15 boundary monuments delineate this site. Boundary monuments are set at corners along an irregular site boundary. According to the LTSP, 20 corner monuments were set along the site boundary; however, previous field investigations indicated that only 15 monuments were actually set because of the rough terrain. Consequently, boundary monument locations BM-8, BM-9, BM-13, BM-17, and BM-20 were only marked with wooden laths and are not included as part of the annual inspection. Several of the survey and boundary monuments at the site are difficult to locate because deadfall and underbrush obscure them, or steep terrain makes accessing them dangerous. All survey and boundary monuments inspected were in good condition (PL-5).

14.4.1.5 Standpipes

Three standpipes (MW-01, MW-02, and MW-03), located on the south side slope of the disposal cell, are used to control and monitor pore-water levels in the disposal cell. Cell pore water is pumped from MW-03 into an evaporation pond. The standpipes were in good condition.

14.4.1.6 Evaporation Pond

A synthetically lined evaporation pond was constructed adjacent to the cell in 2001 to receive water pumped from standpipes MW-02 and MW-03 (only MW-03 is currently pumped). Water was flowing into the pond at the time of the inspection (PL-6). A meteorological station was installed alongside the pond several years ago and is functioning normally.

A detailed inspection of the exposed pond liner was conducted in 2014 and repairs to holes and tears were completed. The pond and its repaired liner, surrounding security fence, and locked gate were in good condition. Two warning signs on the security fence were down and will be replaced before the next inspection.

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 top of the disposal cell and interceptor trench, (2) the toe ditch and toe ditch outlet, (3) onsite reclaimed areas, and (4) the outlying area.

Within each area, inspectors examined specific site-surveillance features. Inspectors also looked for evidence of settlement, erosion, or other modifying processes that might affect the site's integrity or long-term performance.

14.4.2.1 Top of Disposal Cell and Interceptor Trench

Rock armor, consisting of river cobbles and boulders, covers the 71-acre disposal cell and generally remains in excellent condition overall. No evidence of subsidence, differential settling, or slumping was found. Because of the steep slope of the cell cover, particularly in the north portion of the cell, there appeared to be a potential for slope instability. Five years of surveys, concluded in 2011, were conducted in three dimensions to detect any movement of the cover rock; the surveys confirmed that the rock cover is stable. Linear disturbances present on the north portion of the cell cover are remnants of vehicle tracks that formed in the cover rock during monitoring well decommissioning activities in 2002.

During the 2010 inspection, it was noted that a few cobbles or boulders showed signs of frost action and had begun to crack. This is not considered a concern at this time because most of the rock on the cell consists of very competent igneous and metamorphic rock that should remain protective for the expected life of the cell. However, if increased rock degradation becomes apparent, one or more study plots may be established.

Several small pinyon pine trees continue to grow on the south slope of the disposal cell. These trees will be controlled if it is determined that they affect the integrity of the cell. Small, isolated patches of grasses and annual weeds were present on the cell cover and side slope but are not a concern. No deep-rooted plants or noxious weeds were observed in these areas.

A revegetated interceptor trench was constructed at the top of the disposal cell to protect the cell from storm-water and snowmelt run-on. Overall, the trench was functioning as designed and in good condition.

14.4.2.2 Toe Ditch and Toe Ditch Outlet

A toe ditch runs along the downslope (south) edge of the disposal cell and is armored with the same rock that protects the disposal cell. The toe ditch diverts surface runoff from the disposal cell offsite to the east. The ditch was in good condition and was functioning as designed.

Minor erosion, anticipated in the design, is still evident in the channel at the outlet below the toe ditch. Bedrock is exposed in this area. Rock previously placed in the outlet to stabilize the erosion has dropped into and armored the eroded area. No new erosion has occurred in several years, and the outlet was stable at the time of the inspection.

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. The vegetation is composed primarily of desirable grasses and shrubs. Prior to 2012, there was little evidence of cattle or sheep grazing within the site boundaries. This changed dramatically in 2012 when heavy grazing by cattle was observed. This year, however, vegetation was abundant and showed minimal evidence of cattle grazing as compared to previous years.

Three arroyos are present in the reclaimed area south of the disposal cell. 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 self-armored the arroyos and effectively stabilized them from further erosion. This area will continue to be monitored.

Rills noted during previous inspections in the vicinity of perimeter sign P13 were unchanged. The runoff collected by the rills flows along the interface between the cell cover riprap and the adjacent reclaimed soil area. The runoff has scoured a small channel that currently averages about 1-foot wide and less than 1-foot deep, exposing some of the gravel bedding material of the cell cover. This small channel has stabilized and does not threaten the integrity of the disposal cell; however, it will continue to be monitored. In addition, sheetwash and rills noted on the previous year's inspection map along the west side of the cell had been filled in during the year with above-average precipitation at the site.

14.4.2.4 Outlying Area

The area within 0.25 mile of 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 use in the area is grazing and wildlife habitat. Extensive grazing had also occurred on this area in previous years, but minimal evidence grazing was observed during the inspection. No activity or development was observed that might affect site integrity or the long-term performance of the disposal cell.

14.5 Follow-Up Inspections

DOE will conduct follow-up or contingency inspections if (1) an annual inspection or other site visit identifies a condition that requires a return to the site to evaluate the condition, or (2) a citizen or outside agency notifies DOE that conditions at the site or in the vicinity of the site are substantially changed. No need for a follow-up or contingency inspection was identified.

14.6 Maintenance and Repairs

Minor fence repairs and hardware replacement for perimeter sign P4 will be performed before the next inspection.

14.7 Groundwater Monitoring

- 14A Monitoring of groundwater quality is not required at this site because groundwater in the uppermost aquifer is classified as limited use, and the disposal cell is geologically isolated from the first usable aquifer by approximately 380 feet of low-permeability siltstones, shales, and sandstones. The nine monitoring wells that had been at the site were decommissioned in 2002.

14.8 Cell Pore-Water-Level Monitoring

- 14B In accordance with the LTSP, DOE monitors pore-water levels from transient drainage in the disposal cell at standpipes MW-02 and MW-03, installed at the downgradient end of the cell on the south side slope. This monitoring is performed to ensure that water in the cell does not rise above a geotextile liner that was installed in the toe of the cell at an elevation of 6,020 feet.

The LTSP Appendix included a contingency plan if the water level in the disposal cell reached an action level of 6,016 feet in elevation. In 2001, when the action level of 6,016 feet was reached, a cell dewatering system and associated evaporation pond were installed as required by the LTSP.

Pumping from standpipes MW-02 and MW-03 began when water levels reached the action level in 2001. Pumping from both standpipes continued until September 2006, when it was determined that MW-02 could not sustain prolonged pumping due to consistent lack of sufficient recharge. Although pumping at MW-02 was discontinued at that time, the datalogger remains, and water-level monitoring at this standpipe continues. Water pumped from MW-03 is discharged through an above-ground plastic line to the evaporation pond. The discharge line was in good condition.

The solar-powered pump in MW-03 is normally operated June through September. The two solar panels that power the pump were in good condition.

Datalogger information for the 2015 reporting period indicates that pore-water levels in both standpipes were always below the 6,016-foot action level (Figure 14-2). As observed historically, levels were highest during late fall and winter, when pumping is discontinued. In 2015, maximum water levels in MW-02 and MW-03 were 6,015.5 feet and 6,015.9 feet, respectively. Water levels declined to 6,015.1 feet and 6,014.9 feet, respectively, during pumping. According to the LTSP requirement, pumping will continue until the water levels in the standpipes stabilize at an elevation of 6,014 feet or lower.

This continued contingency operation has maintained the water level at an acceptable elevation (below the action level) and prevents water from overtopping the disposal cell liner. Dewatering of the cell will continue.

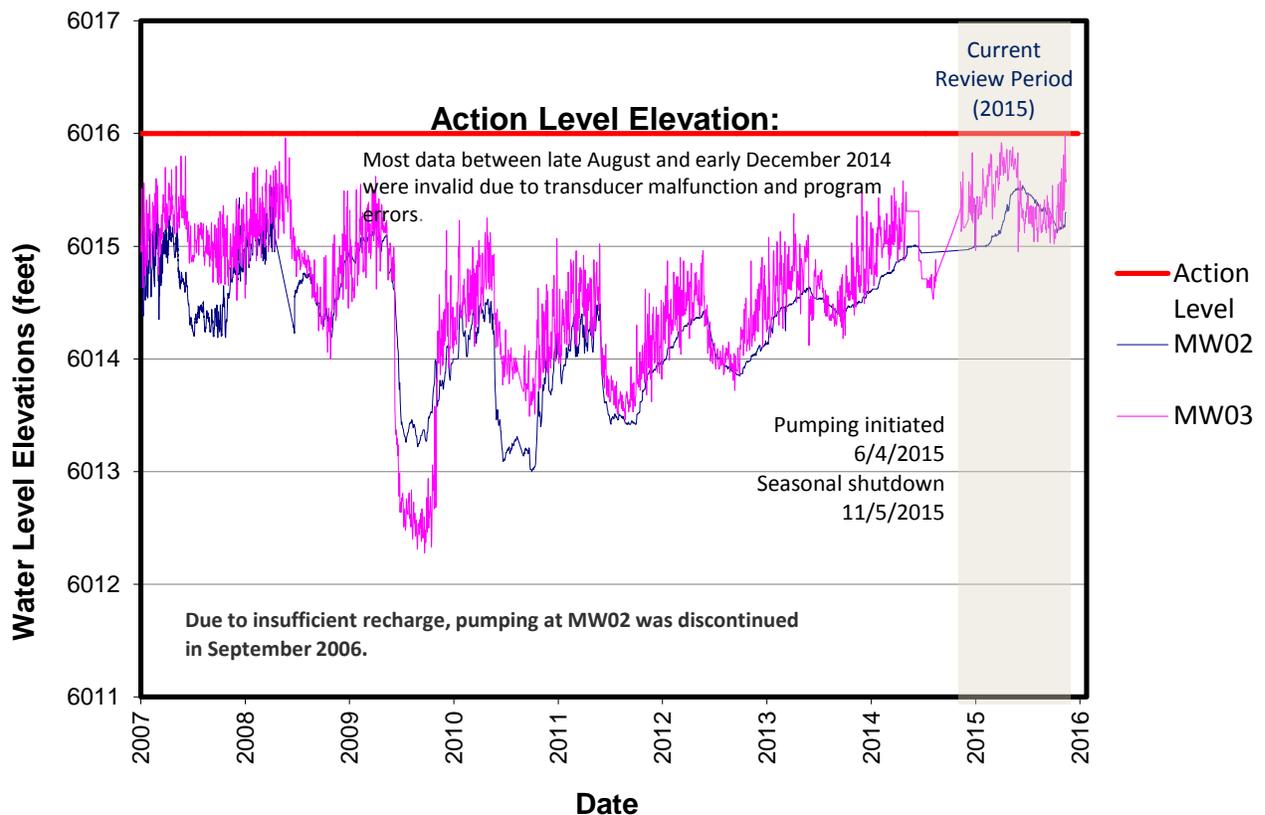


Figure 14-2. Disposal Cell Pore-Water Levels in Standpipes MW-02 and MW-03 at the Rifle Disposal Site

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. No need for corrective action was identified.

14.10 Photographs

Photograph Location Number	Azimuth	Photograph Description
PL-1	285	Broken barbed wire.
PL-2	280	Closed fence gate.
PL-3	190	Perimeter sign P4.
PL-4	0	Site marker SMK-1.
PL-5	5	Boundary monument BM-3.
PL-6	225	Water entering evaporation pond.



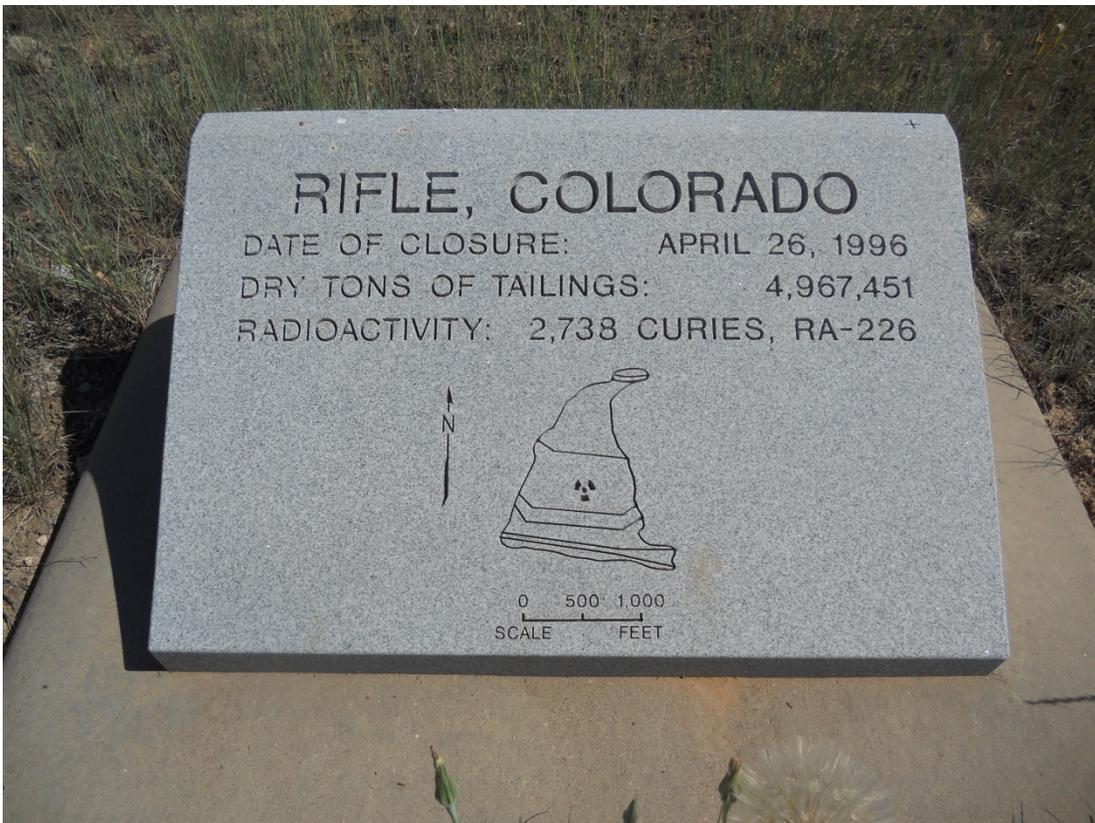
RFL 6/2015. PL-1. Broken barbed wire.



RFL 6/2015. PL-2. Closed fence gate.



RFL 6/2015. PL-3. Perimeter sign P4.



RFL 6/2015. PL-4. Site marker SMK-1.



RFL 6/2015. PL-5. Boundary monument BM-3.



RFL 6/2015. PL-6. Water entering evaporation pond.