

3.0 Annual Inspection of the Canonsburg, Pennsylvania, UMTRCA Title I Disposal Site

3.1 Compliance Summary

The Canonsburg, Pennsylvania, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site was inspected on October 17, 2012. The disposal cell and all associated surface water diversion and drainage structures were in excellent condition and functioning as designed. No additional maintenance needs or cause for a follow-up or contingency inspection was identified.

An effective vegetative management program that aligns with requirements set forth within the *Long-Term Surveillance Plan for the U.S. Department of Energy Canonsburg Uranium Mill Tailings Disposal Site, Canonsburg, Pennsylvania* (LMS/CAN/S00404-0.0, U.S. Department of Energy [DOE], revised September 2008; LTSP) remains successful (PL-1). In-the-field discussions with site maintenance personnel during the inspections continue to provide lesson-learned opportunities to improve the efficiency and effectiveness of site maintenance activities.

In accordance with the LTSP, a groundwater monitoring assessment was conducted following the collection of samples in fall 2010 to recommend whether to continue, modify, or terminate the groundwater monitoring program. The assessment concluded that the compliance strategy for the site remains effective, and that the low and slowly changing concentrations of uranium in both groundwater and surface water warrant a monitoring change. The assessment recommended that following the collection of samples in 2011, the frequency of monitoring be reduced from annual to once every 5 years. On July 16, 2012, the U.S. Nuclear Regulatory Commission (NRC) issued its concurrence to reduce the sampling from annual to every 5 years. Therefore, no samples were collected in 2012. A 5-year sampling frequency will commence in 2013. Sampling at the site is being coordinated with sampling at the Burrell, Pennsylvania, UMTRCA Title I Disposal Site in order to improve efficiency and lower costs. Sampling was conducted last in October 2011. Monitoring results, which were not available in time to be included in the 2011 compliance report, are provided in this report. Results from 2011 demonstrate continued compliance with established site standards.

Numbers in the left margin of this report refer to items summarized in the “Executive Summary” table.

3.2 Inspection Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the LTSP and in procedures established by DOE to comply with the requirements of Title 10 *Code of Federal Regulations* Part 40.27 (10 CFR 40.27). Table 3–1 lists these requirements.

Table 3–1. License Requirements for the Canonsburg Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 3.3	Section 3.4
Follow-Up or Contingency Inspections	Section 3.4	Section 3.5
Maintenance and Repairs	Section 3.5	Section 3.6
Groundwater and Surface Water Monitoring	Section 3.7	Section 3.7.1
Corrective Action	Section 3.6	Section 3.8

3.3 Institutional Controls

The 34.2-acre site is owned by the United States of America and was accepted under the NRC general license (10 CFR 40.27) in 1996. DOE is the licensee and, in accordance with the requirements for UMTRCA Title I sites, is responsible for the custody and long-term care of the site. Institutional controls at the site include federal ownership of the property and the following features that are inspected annually: site markers, survey and boundary monuments, warning/no-trespassing signs, a site perimeter fence, and locked gates at the site entrances.

Institutional controls also apply to Area C and former Tract 117, which are southeast of Strabane Avenue. Area C (3.1 acres) was sold and transferred in 2006, and former Tract 117 (0.431 acre) was sold and transferred in 2009; the same private party purchased both. DOE and the Commonwealth of Pennsylvania complied with restrictions on parcel transfers stipulated in UMTRCA and the Cooperative Agreement between DOE and the Commonwealth. The deed for Area C and former Tract 117 establishes restrictions to limit excavation in the areas, prohibits the disturbance of the stream bank, maintains access for monitoring, and prevents the areas from being used for residential purposes. Inspectors found no evidence that these institutional controls were ineffective.

The land owner of Area C and former Tract 117 has elevated the land surface of both areas through the placement and grading of clean fill material (PL-2). This does not violate institutional controls. DOE owns two groundwater monitoring wells on Area C and former Tract 117. The land owner has taken excellent steps to provide adequate access to both wells, and to protect the integrity of both wells by grading the fill in a manner that should not result in surface water pooling around the base of the well pads (PL-3).

3.4 Inspection Results

The site, between the communities of Canonsburg and Houston, Pennsylvania, was inspected on October 17, 2012. M. Miller, K. Broberg, and J. Homer, all with the S.M. Stoller Corporation, the DOE Legacy Management Support contractor, conducted the inspection. C. Carpenter, with the DOE Office of Legacy Management, also participated in the inspection.

The purposes of the inspection were to confirm the integrity of visible features at the site, to identify changes in conditions that may affect site integrity, and to determine the need, if any, for maintenance or additional inspections and monitoring.

3.4.1 Site Surveillance Features

The locations of site surveillance features are shown in Figure 3-1. 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 in Figure 3-1 by photograph location (PL) numbers.

3.4.1.1 Entrance Gates, Entrance Signs, and Access Road

Access to the site is directly from Strabane Avenue, a public right-of-way within the Borough of Canonsburg in Washington County, Pennsylvania. All four site gates were in excellent condition. The entrance sign was in good condition.

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3.4.1.2 Perimeter Fence and Perimeter Signs

The security fence was in excellent condition with the exception of a small hole in the fence at perimeter sign P2. In 2011, for unknown reasons, someone cut perimeter sign P2 from the fence and left a small hole in its place. A new sign was installed to cover the hole in the fence (PL-4). A vegetation-free buffer zone is being maintained around the entire site security fence (PL-5). The 11 perimeter signs were in good condition.

3.4.1.3 Site Markers

The site contains two site markers, SMK-1 near the entrance gate and SMK-2 on top of the disposal cell. Both were in excellent condition.

3.4.1.4 Survey Monuments and Boundary Monuments

There are three survey monuments and four boundary monuments. All monuments are in excellent condition.

3.4.1.5 Erosion Control Markers

The eight erosion control markers were in excellent condition.

3.4.1.6 Monitoring Wells

The site's monitoring well network consists of five wells (0406A, 0412, 0413, 0414B, and 0424). The wells are inspected when they are sampled. All of the monitoring wells were properly locked during the inspection.

3.4.2 Inspection Areas

In accordance with the LTSP, the site is divided into five inspection areas (referred to as "transects" in the LTSP) to ensure a thorough and efficient inspection: (1) the disposal cell, (2) the diversion channels and perimeter ditch, (3) the other areas on site, (4) the site perimeter, and (5) the outlying area.

Within each area, inspectors examined specific site surveillance features, such as monitoring wells, boundary monuments, and signs. Inspectors examined each area for evidence of erosion, settling, slumping, or other disturbances that might affect the site's integrity, protectiveness, or long-term performance.

3.4.2.1 Disposal Cell

The grass-covered disposal cell surface was in excellent condition. There was no evidence of slumping, settling, erosion, or other modifying processes. The grass was mowed in accordance with the LTSP.

Animal burrows continue to be observed on the cell cover. Because a 36-inch-thick clay layer (radon barrier), an 18-inch-thick rock layer, and a 12-inch-thick topsoil layer overlie the buried

tailings at this site, biointrusion into the tailings is unlikely, and such burrows should not pose a risk to the disposal cell's integrity or the public's health. The location, level of activity, and significance of burrows on the cell cover will continue to be monitored.

3.4.2.2 Diversion Channels and Perimeter Ditch

Diversion channels around the disposal cell and the perimeter ditch along the south side of the site are armored with riprap and were in excellent condition (PL-6). No indications of diminished rock durability were noted. Woody vegetation in the diversion ditches continues to be controlled by cutting and spraying.

3.4.2.3 Other Areas on Site

Thick grass covers the area surrounding the disposal cell. The grass extends beyond the security fence to the north and east as far as the bank of Chartiers Creek. The grass inside the site boundary was in excellent condition. It is mowed in accordance with the LTSP. Vegetation management continues to be successfully implemented.

3.4.2.4 Site Perimeter

Chartiers Creek is an active, meandering waterway that abuts the east, north, and west portions of the site. As a result of flooding in past years, particularly in 2004, the creek cut into the bank and resulted in a series of stream bank stabilization efforts. Both the Borough of Canonsburg and DOE funded the work. NRC representatives evaluated the plans and concurred on the work.

In 2001, the Chartiers Creek bank along Area C was reconstructed to stop slumping. In 2004, inspectors found that floodwater eroded the stream bank. Approximately 100 feet of reconstructed stream bank was damaged downstream from the Strabane Avenue Bridge, and 200 feet was damaged upstream from the railroad bridge. Floodwater cut laterally into the bank and scoured behind the riprap and fabric in places. DOE notified NRC, performed a follow-up inspection of the damage, and developed recommendations for creek bank repair along Area C. NRC concurred on the recommendations, and in April 2005, repairs were made (scoured areas along Area C were filled with riprap to restore the creek bank profile). Shrub and forb seed was broadcast to further stabilize the bank with vegetation. In 2006, the area between perimeter signs P7 and P8 was stabilized, and in 2008, the area between perimeter sign P8 and Strabane Avenue Bridge was stabilized. The stabilization work consisted of cutting back the slope of the creek bank and armoring the toe with riprap keyed into bedrock. Geotextile fabric underlies the riprap. Above the riprap, stabilization matting and new plantings of live fascines protect the slope.

In 2009, reseeding and the planting of large saplings (greater than 2 inches in diameter) took place within the area that was regraded in 2008 as part of a stream bank stabilization project. The trees were planted under a third-party DOE Office of Legacy Management grant. Several of the trees planted in 2009 did not survive and were replaced with healthy trees in 2010, which continue to do well (PL-7). The stream bank stabilization project dramatically changed the look of the site. There is a sharp contrast between the riprap-armored south bank of Chartiers Creek (where vegetation growth is managed) and the unarmored north bank (where vegetation growth is not managed).

3.4.2.5 Outlying Area

The predominant land use near the site is residential and commercial. The area outward, for a distance of approximately 0.25 mile, was visually inspected. With the exception of Area C and former Tract 117 (discussed earlier) no new development or changes in land use were observed that would affect the safety or security of the site.

In 2007, DOE conducted a radiological survey on a small portion of the site property that lies outside the perimeter fence southwest of the disposal cell. The survey was conducted to evaluate the potential for releasing this portion of the site for industrial reuse. The survey identified isolated radium-226 contamination in soil that exceeded UMTRCA standards for unrestricted use. DOE retains this portion of the site. Under the current property use, the radiological conditions do not pose unacceptable risk to personnel, and no corrective measures are required. DOE has added monitoring for disturbance of this area to inspection procedures. No disturbances were noted during this year's inspection.

3.5 Follow-Up or Contingency Inspections

DOE will conduct follow-up inspections if (1) an annual inspection or other site visit reveals a condition that must be reevaluated during a return to the site, or (2) a citizen or outside agency notifies DOE that conditions at the site are substantially changed.

No need for a follow-up or contingency inspection was identified during the inspection.

3.6 Maintenance and Repairs

- 3A In 2012, DOE controlled woody growth within the diversion channels, mowed grass on and adjacent to the disposal cell, and cleared vegetation from the perimeter fence.

3.7 Environmental Monitoring

3.7.1 Groundwater and Surface Water Monitoring

DOE monitors groundwater and surface water at the site to comply with the requirements in the revised LTSP. The revised LTSP combines the objectives of both the original LTSP (issued in 1995) and the *Ground Water Compliance Action Plan and Application for Alternative Concentration Limits for the Canonsburg, Pennsylvania, UMTRA Project Site* (U0035901, DOE, February 2000; GCAP). Monitoring prescribed in the original LTSP was a best management practice because NRC determined that cell performance monitoring to ensure compliance with remedial actions discussed under Subpart A of 40 CFR 192 was not required since the disposal cell's design was adequate to provide long-term protection of human health and the environment. The GCAP required monitoring for a period of no less than 5 years (through 2004) and up to 30 years (through 2029, which is the estimated time for any contamination to naturally attenuate). This monitoring period was established to ensure compliance with Subpart B of 40 CFR 192, which applies to contamination related to legacy uranium-processing sites. The Subpart B protection strategy is no remediation in conjunction with the application of an alternate concentration limit (ACL) for uranium.

The objectives of groundwater monitoring under the revised LTSP are to (1) evaluate downgradient contaminant trends in groundwater in the shallow unconsolidated materials and in surface water, (2) demonstrate that concentrations of uranium at point-of-compliance locations are decreasing as predicted and that the system remains in compliance with the GCAP, and (3) ensure that remedial actions at the site and Area C continue to protect human health, safety, and the environment. The ACL for uranium is 1.0 milligram per liter (mg/L) at point-of-compliance wells (0412, 0413, and 0414B). The U.S. Environmental Protection Agency maximum concentration limit for uranium is 0.044 mg/L (40 CFR 192, Subpart A, Table 1). The uranium limit established for the point of exposure in Chartiers Creek is 0.01 mg/L (surface location 0602).

The monitoring network consists of five wells (0406a, 0412, 0413, 0414B, and 0424) completed in the uppermost aquifer (shallow unconsolidated materials), and one surface water location in Chartiers Creek (0602). Each year, routine field measurements are collected, water levels are measured, and uranium concentrations are determined.

DOE considers the risk associated with uranium in groundwater within the unconsolidated materials and shallow bedrock (defined as the uppermost aquifer for regulatory purposes) beneath the site to be negligible because neither is considered a viable aquifer, from a water-resource perspective, even though the zone is capable of discharging to surface water (Appendix A to 10 CFR 40). Because the materials are not ideal for aquifer formation and because the source of recharge to the shallow units is minimal, sustained yield to a well from these units would be limited. The shallow groundwater is not used as a drinking water source in the area although some domestic water is derived from a few private wells that extend deeper than 100 feet.

Institutional controls, in the form of government ownership of the site, prevent access to the groundwater directly beneath the site. NRC concurred on deleting groundwater use restrictions for Area C in 2003. Most of the residents in the area are connected to a municipal water system, which is supplied by surface water reservoirs upgradient of the site. Chartiers Creek, the discharge point for the shallow groundwater beneath the site, is not a source of potable water. Additionally, uranium concentrations reported from samples collected from the creek are near the detection limit. Therefore, site-related concentrations do not pose an unacceptable risk to human health and the environment.

DOE conducted groundwater monitoring in October 2011, and results were not available in time to be included in the 2011 compliance report. Therefore, the results from 2011 are presented in this report.

Analytical results for groundwater and surface water monitoring are presented below. Time-concentration plots for uranium, from 1995 through 2011, are shown in Figure 3–2 for groundwater and in Figure 3–3 for surface water. The results of the 2011 monitoring demonstrate continued compliance with established site standards.

Uranium concentrations in 2011 were considerably below the established ACL (Figure 3–2). With the exception of monitoring wells 0412 and 0413, uranium concentrations in 2011 also were below the maximum concentration limit.

Only one surface water location (0602) is sampled under the revised LTSP. The uranium concentration of surface water at location 0602 in 2011 remained below the target concentration of 0.01 mg/L (Figure 3–3).

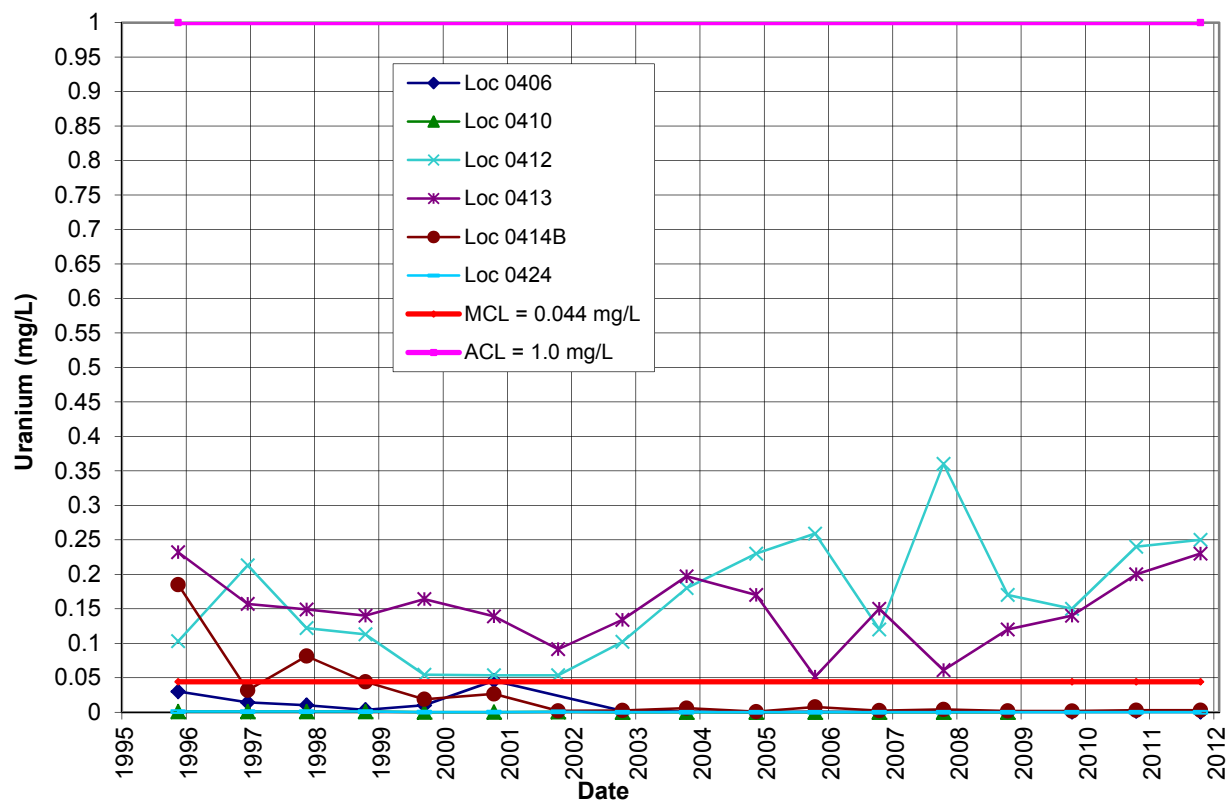


Figure 3–2. Time-Concentration Plot of Uranium in Groundwater at the Canonsburg Disposal Site

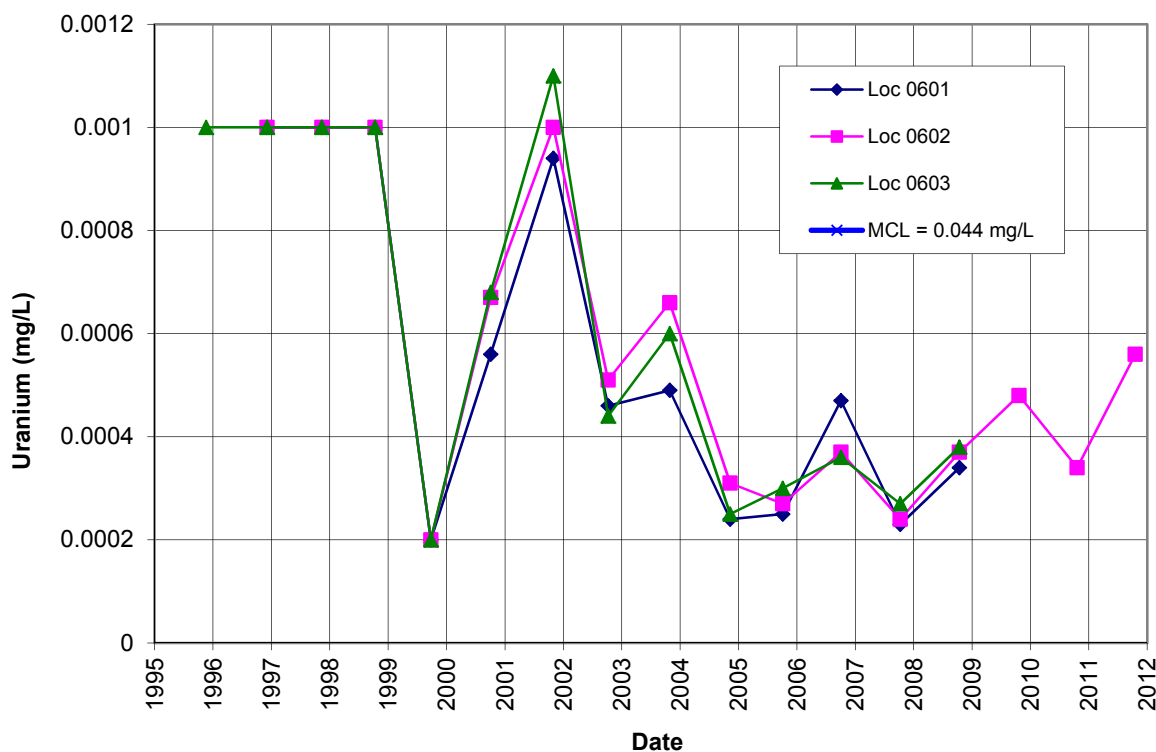


Figure 3-3. Time-Concentration Plot of Uranium in Surface Water at the Canonsburg Disposal Site

In 2011, DOE evaluated the groundwater and surface water monitoring program at the site, as required by the LTSP, to recommend whether to continue, modify, or terminate monitoring efforts. Five additional years of monitoring data (2006 through 2010) were added to the previous data set (1986 through 2005). The assessment concluded that:

- Groundwater and surface water uranium concentrations remain well below site ACLs, resulting in no adverse impact at the point of exposure in Chartiers Creek. Therefore, the compliance strategy continues to be protective of human health and the environment.
- Water levels measured at the site are steady and within the historical range.
- A monitoring change is warranted due to the low and slowly changing concentrations of uranium in both groundwater and surface water.

3B The assessment recommended that following the collection of samples in 2011, the frequency of monitoring at the site be reduced from annual to once every 5 years for cell-performance purposes. NRC approved the sampling change in 2012. Groundwater and surface water sampling is scheduled next for 2013, and will then be conducted every 5 years. Sampling at the site is being coordinated with the Burrell site to improve efficiency and decrease travel costs.

3.8 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 corrective action was required in 2012.

3.9 Photographs

Table 3–2. Photographs Taken at the Canonsburg Disposal Site

Photograph Location Number	Azimuth	Photograph Description
PL–1	225	Riprap-armored stream bank.
PL–2	340	Looking northwest across Area C.
PL–3	315	Area around monitoring well 0414B.
PL–4	NA	Fence repair at perimeter sign P2.
PL–5	320	Fence line, northeast of disposal cell.
PL–6	270	Looking west down riprap-armored diversion ditch.
PL–7	NA	Floodplain northeast of disposal cell.



CAN 10/2012. PL-1. Riprap-armored stream bank.



CAN 10/2012. PL-2. Looking northwest across Area C.



CAN 10/2012. PL-3. Area around monitoring well 0414B.



CAN 10/2012. PL-4. Fence repair at perimeter sign P2.



CAN 10/2012. PL-5. Fence line, northeast of disposal cell.



CAN 10/2012. PL-6. Looking west down riprap-armored diversion ditch.



CAN 10/2012. PL-7. Floodplain northeast of disposal cell.

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