

3.0 Canonsburg, Pennsylvania, Disposal Site

3.1 Compliance Summary

The Canonsburg, Pennsylvania, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site was inspected on October 20, 2010. The disposal cell and all associated surface water diversion and drainage structures were in excellent condition and functioning as designed. No other maintenance needs or cause for a follow-up or contingency inspection was identified.

Vegetation management continues (including lessons-learned and in-the-field discussion with vegetation management personnel) and vegetation cover at the site is responding with continuous improvement. The combination of spraying and mowing that is conducted at the site has greatly reduced the extent of noxious/invasive weeds.

During 2010, access to an unfenced portion of the site, north of the disposal cell, was improved by the installation of a small footbridge across a riprap-lined diversion ditch. Trees that were planted in 2009 in the same area as the footbridge and that did not survive were replaced with healthy trees in 2010.

DOE conducts groundwater monitoring at Canonsburg annually. October 2009 monitoring results were not available in time to be included in the 2009 compliance report, and they are provided in this report. Results from 2009 monitoring demonstrated continued compliance with established site standards. October 2010 monitoring results are not available for this report and will be provided in the compliance report for 2011. In accordance with the long-term surveillance plan (LTSP), after 2010 the need for continued monitoring will be reevaluated. This evaluation will be made once 2010 monitoring results are available. Any changes made to the monitoring will be done in consultation with the Commonwealth of Pennsylvania and with concurrence of the U.S. Nuclear Regulatory Commission (NRC).

3.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the Canonsburg Disposal Site are specified in 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 22, 2008) 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 3.3.1
Follow-Up or Contingency Inspections	Section 3.4	Section 3.3.2
Routine Maintenance and Repairs	Section 3.5	Section 3.3.3
Groundwater and Surface Water Monitoring	Section 3.7	Section 3.3.4
Corrective Action	Section 3.6	Section 3.3.5

Institutional Controls—Institutional controls at the disposal site, as defined by DOE Policy 454.1, consist of federal ownership of the property, a site security fence, warning/no-trespassing signs on the security fence, and a locked gate at the entrance to the site. Verification of these institutional controls is part of the annual inspection.

The 34.2-acre disposal 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 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, and the same private party purchased both. DOE and the Commonwealth 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 or violated.

3.3 Compliance Review

3.3.1 Annual Inspection and Report

The site, between the communities of Canonsburg and Houston, Pennsylvania, was inspected on October 20, 2010. Figure 3–1 shows features and photograph locations (PLs) mentioned in this report. Numbers in the left margin of this report refer to items summarized in the “Executive Summary” table.

3.3.1.1 Specific Site-Surveillance Features

Access, Gates, Fence, and Signs—Access to the site is directly from Strabane Avenue, a public right-of-way within the Borough of Canonsburg in Washington County, Pennsylvania. The security fence and all four site gates were in excellent condition. A vegetation-free buffer zone is being maintained around the entire site security fence. The entrance sign and 11 perimeter signs were in good condition.

A small footbridge was installed north of the disposal cell in 2010, improving access to an unfenced portion of the site (PL–1). The footbridge provides a safer way for the public to cross a riprap-lined diversion ditch (PL–2). The footbridge was in excellent condition.

Site Markers and Monuments—The site contains two site markers, eight erosion control markers, three survey monuments, and four boundary monuments.

Both site markers are in excellent condition. Four pairs of erosion control markers were initially installed along the bank of Chartiers Creek. Three pairs are in excellent condition, and the fourth pair requires a replacement. Erosion control marker EC–4A was lost to erosion in 1997. Now

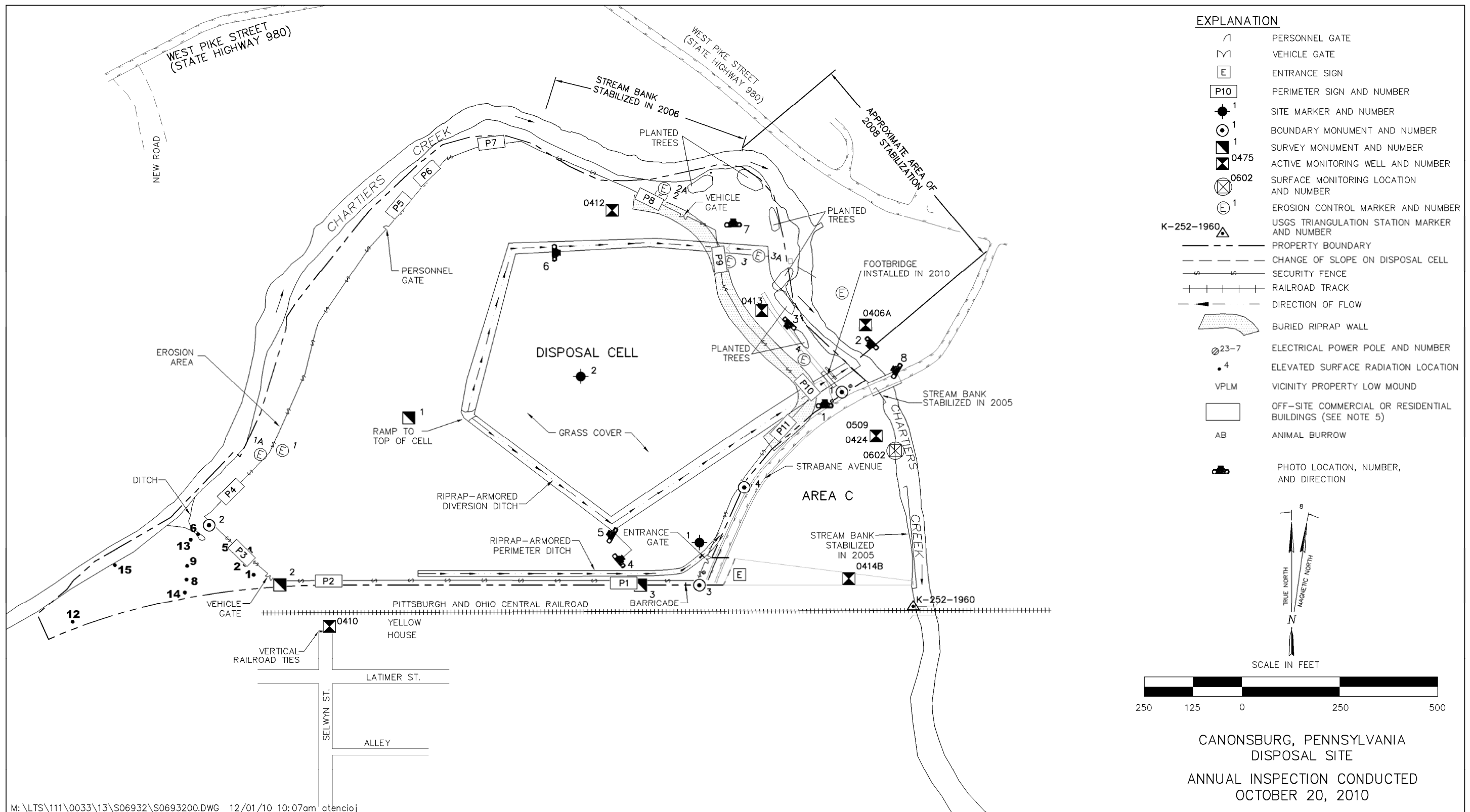


Figure 3-1. 2010 Annual Compliance Drawing for the Canonsburg Disposal Site

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- 3A that Stream Bank Stabilization in the area is complete, the marker will be replaced. This work will be coordinated with similar work at the Burrell, Pennsylvania, Disposal Site to improve efficiency and reduce costs.

The three survey monuments and four boundary monuments were located and were in excellent condition.

Monitoring Wells—The Canonsburg monitoring well network consists of five wells (MW-0406A, MW-0412, MW-0413, MW-0414B, and MW-0424). The wells are inspected when they are sampled. A few minor maintenance needs were identified this year (e.g., leaning/lose protective bollards, lack of protective bollards, lack of drain holes in the outer protective casing). These minor monitoring well-maintenance needs will be addressed in an upcoming groundwater monitoring evaluation scheduled for 2011. Wells identified in the evaluation as no longer being needed for monitoring purposes at the site will be recommended for plugging and abandonment rather than repaired.

3.3.1.2 Transects

To ensure a thorough and efficient inspection, inspectors divided the site into five areas called “transects”: (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.

The area inside each transect is inspected by walking a series of traverses. Within each transect, the inspectors examine specific site-surveillance features, drainage structures, and vegetation. Inspectors also look for evidence of settlement, erosion, or other modifying processes that might affect the site’s integrity or long-term performance.

- 3B **Disposal Cell**—The grass-covered disposal cell surface was in excellent condition (PL-3). There was no evidence of slumping, settling, erosion, or other modifying processes. The grass is mowed and mulched in accordance with the LTSP. DOE continued to successfully control noxious and invasive weeds through a combination of mowing and spot-spraying.

- 3C 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.

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 good condition (PL-4, PL-5, and PL-6). No indications of diminished rock durability were noted. Woody vegetation in the diversion ditches continues to be controlled by cutting and spraying.

- 3D **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 and mulched in accordance with the LTSP. Vegetation management continues to be dramatically improved. The combination of spraying and mowing has greatly reduced the extent of noxious and invasive weeds on site. Lessons-learned opportunities in vegetation management are resulting in

continuous improvements to the herbaceous cover at the site. In-the-field discussions with vegetation management personnel during the inspections continue to improve the efficiency and effectiveness of vegetation management activities (PL-7).

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 required a series of stream bank stabilization efforts. Both the Borough of Canonsburg and DOE funded the work. NRC representatives evaluated the plans and concurred in 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 in 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 (greater than 2-inch diameter saplings took place within the area that was regraded in 2008 as part of a Stream Bank Stabilization Project (PL-8). The trees were planted under a third-party Office of Legacy Management grant. Several of the trees planted in 2009 did not survive and were replaced with healthy trees in 2010.

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 for development or changes in land use that might affect the safety or security of the site. No new development or changes in land use were observed. Former Tract 117, southeast of Strabane Avenue, was sold and transferred in 2009.

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.

3.3.2 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 follow-up or contingency inspections were required in 2010.

3.3.3 Routine Maintenance and Repairs

In 2010, DOE controlled woody growth within the diversion channels, mowed grass on and adjacent to the disposal cell, cleared vegetation from the perimeter fence, sprayed noxious and invasive weeds, and reseeded and planted trees along the stream bank.

3.3.4 Groundwater and Surface Water Monitoring

- 3E DOE monitors groundwater and surface water at the Canonsburg 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). 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 groundwater compliance action plan (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 (POC) locations are decreasing as predicted and that the system remains in compliance with the GCAP, and (3) ensure that remedial actions at the disposal 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 POC wells (MW-0412, MW-0413, and MW-0414B). The U.S. Environmental Protection Agency maximum concentration limit (MCL) 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 (location SW-0602).

The monitoring network consists of five wells (MW-0406a, MW-0412, MW-0413, MW-0414B, and MW-0424) completed in the uppermost aquifer (shallow unconsolidated materials), and one surface water location in Chartiers Creek (SW-0602). Routine field measurements are collected, water levels measured, and uranium concentrations determined. Monitoring was performed annually through 2010. After 2010, the need for annual monitoring will be reevaluated. Any changes made to the monitoring will be done in consultation with the Commonwealth and with NRC concurrence.

DOE conducted groundwater monitoring in October 2009 and results were not available in time to be included in the 2009 compliance report. Therefore, the results from 2009 are presented in this report. DOE also conducted groundwater monitoring in October 2010. Results from October 2010 are not available for this report, and they will be provided in the 2011 compliance report and in the upcoming groundwater monitoring evaluation discussed above.

Monitoring Results—Analytical results for groundwater and surface water monitoring are presented below. Time-concentration plots for uranium, from 1995 through 2009, are shown in Figure 3–2 for groundwater and in Figure 3–3 for surface water. The results of the 2009 monitoring demonstrate continued compliance with established site standards.

Groundwater—Uranium concentrations in 2009 were considerably below the established ACL (Figure 3–2). With the exception of monitoring well MW–0412 and monitoring well MW–0413, uranium concentrations in 2009 were also below the MCL.

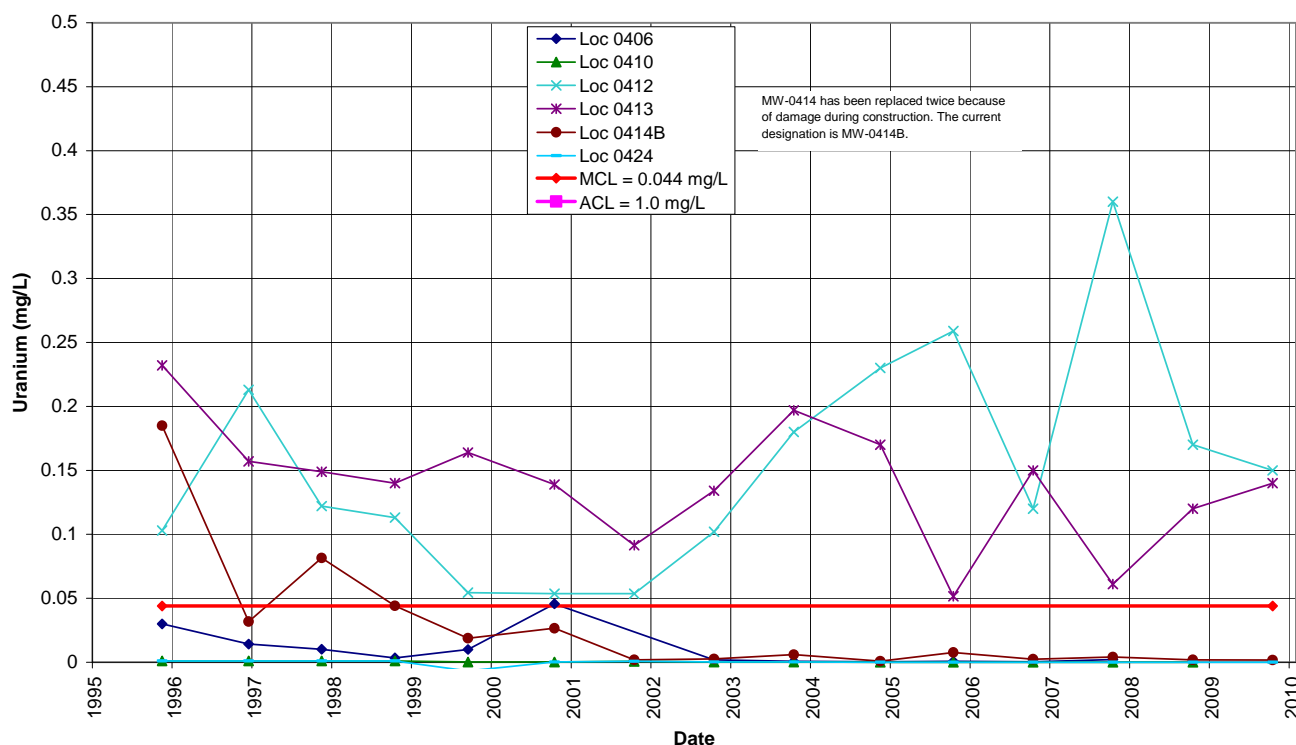


Figure 3–2. Time-Concentration Plot of Uranium in Groundwater at the Canonsburg Disposal Site

Surface Water—Only one surface water location (SW–0602) is sampled under the revised LTSP. The uranium concentration of surface water at location SW–0602 in 2009 remained below the target concentration of 0.01 mg/L (Figure 3–3).

DOE continues to consider 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 Part 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.

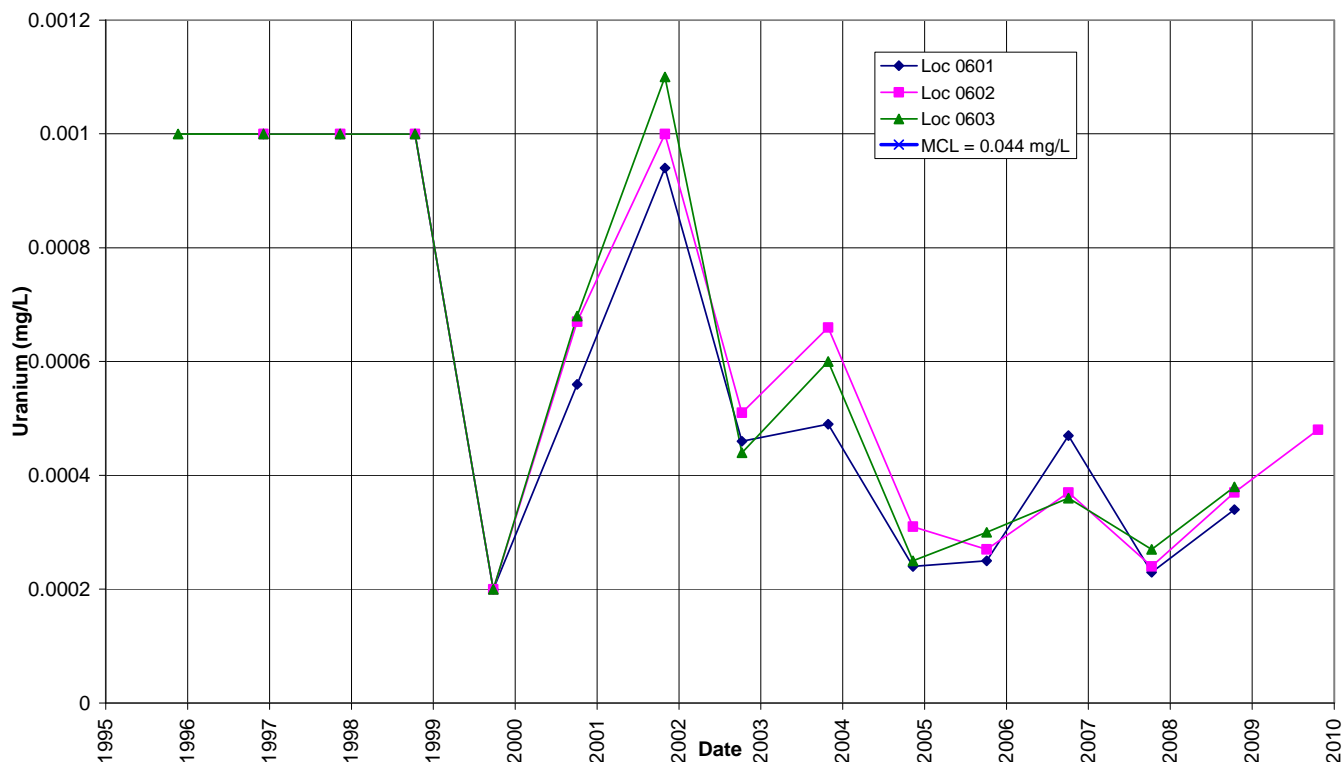


Figure 3-3. Time-Concentration Plot of Uranium in Surface Water at the Canonsburg Disposal Site

Institutional controls, in the form of government ownership of the site, prevent access to the groundwater directly beneath the site. NRC concurred in 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 from 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.

3.3.5 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 2010.

3.3.6 Photographs

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

Photograph Location Number	Azimuth	Photograph Description
PL–1	360	Newly installed footbridge across a riprap armored diversion ditch.
PL–2	225	Footbridge across a riprap armored diversion ditch.
PL–3	225	North side slope of disposal cell.
PL–4	50	Riprap armored diversion ditch.
PL–5	300	Riprap armored diversion ditch.
PL–6	90	Looking down channel of a riprap armored diversion ditch.
PL–7	NA	In-the-field lessons-learned session.
PL–8	300	Riprap armored stream bank along floodplain area.



CAN 10/2010. PL-1. Newly installed footbridge across a riprap armored diversion ditch.



CAN 10/2010. PL-2. Footbridge across a riprap armored diversion ditch.



CAN 10/2010. PL-3. North side slope of disposal cell.



CAN 10/2010. PL-4. Riprap armored diversion ditch.



CAN 10/2010. PL-5. Riprap armored diversion ditch.



CAN 10/2010. PL-6. Looking down channel of a riprap armored diversion ditch.



CAN 10/2010. PL-7. In-the-field lessons-learned session.



CAN 10/2010. PL-8. Riprap armored stream bank along floodplain area.