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 4, 2011. 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 to be successfully implemented. Control of invasive species identified through physical site inspections, combined with mowing the grassland for weed control, has proven to be effective.

DOE conducts groundwater monitoring at the site annually. October 2010 monitoring results, which were not available in time to be included in the 2010 compliance report, are provided in this report. Results from 2010 demonstrate continued compliance with established site standards. October 2011 monitoring results are not available for this report and will be provided in the compliance report for 2012.

In accordance with 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; 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, which is currently undergoing U.S. Nuclear Regulatory Commission (NRC) review, 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 recommends that following the collection of samples in 2011, the frequency of monitoring be reduced from annual to once every 5 years.

3.2 Compliance 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 3.3.1
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 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 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; 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 or violated.

Large piles of fill material have been placed on Area C by the property owner within the last year (photograph location [PL]–1). The placement of the fill does not violate any institutional controls connected with the property. A minimum of 20 feet of clearance is being maintained to DOE groundwater monitoring wells. Post-inspection discussions with the property owner indicate that the placement of additional fill material on the property is not anticipated at this time.

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 4, 2011. Figure 3–1 shows features and 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 (PL–2). 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. The footbridge provides a safer way for the public to cross a riprap-lined diversion ditch. The footbridge was in excellent condition.

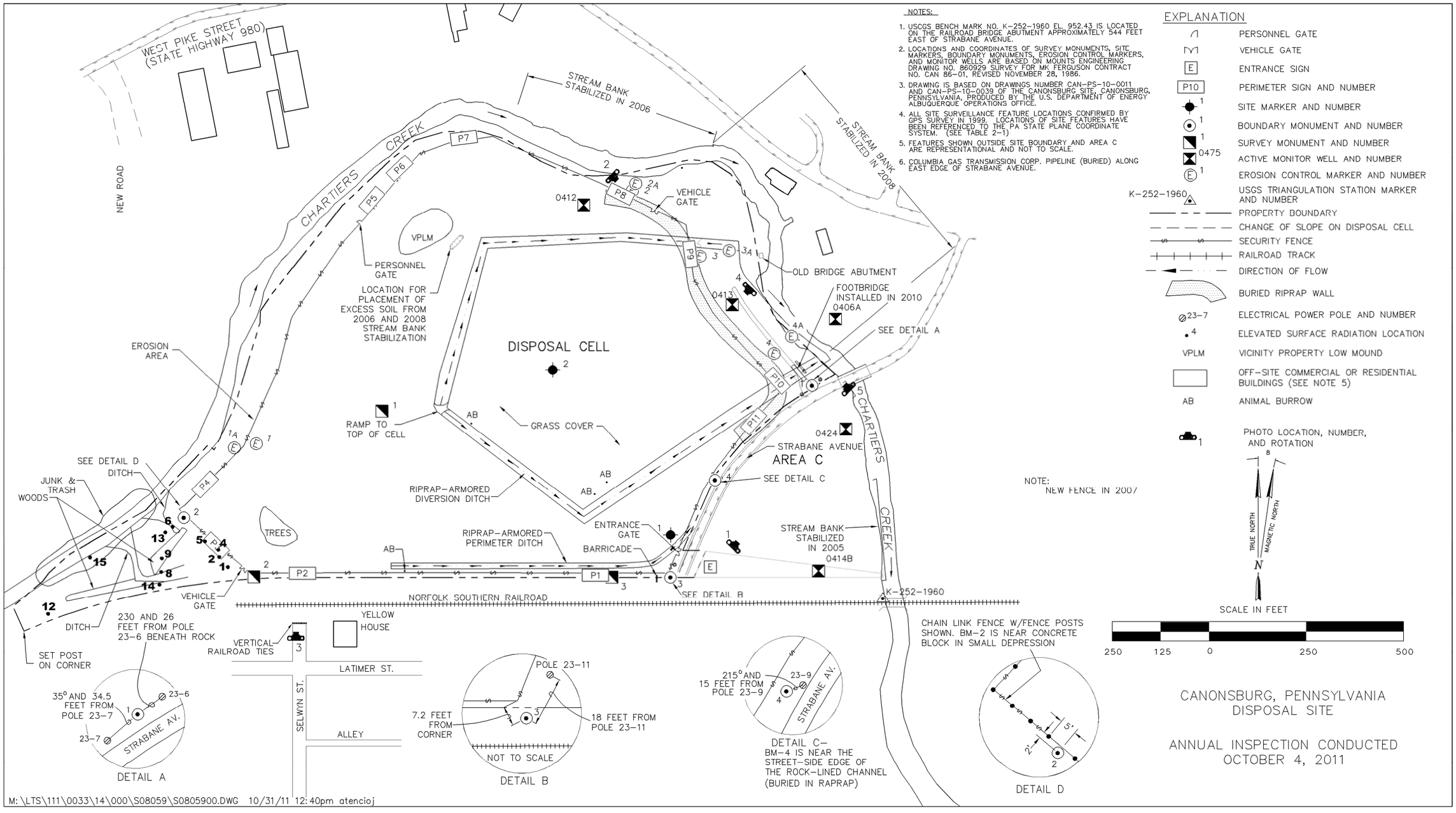

Figure 3–1. 2011 Annual Compliance Drawing for the Canonsburg Disposal Site

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

All site markers and monuments are in excellent condition. Erosion control marker EC–4A was replaced just prior to this year's inspection. The original monument was lost several years ago to flooding along Chartiers Creek. Installation of a replacement marker was delayed to coincide with the completion of several stream bank stabilization projects in the area of the monument, including revegetation associated with those projects.

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. Monitoring is usually scheduled to be conducted during the same week as the annual inspection, but this year the inspection schedule was accelerated and the sampling schedule was not.

All of the monitoring wells were in excellent condition. Monitoring well 0410 (a background well that was no longer used) was safely plugged and abandoned on September 12, 2011, in accordance with the Pennsylvania Water Well Drillers License Act (Act 610). The site of the abandoned well was in excellent condition (PL–3).

Several minor well maintenance tasks were safely completed in September 2011:

- Drain holes were installed in the protective casings of wells 0406A, 0412, and 0413.
- A brass identification tag was installed on well 0413.
- A concrete pad and protective bollards were installed at well 0413 (PL–4).
- Protective bollards were repaired or installed at wells 0414B and 0424.

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.

Disposal Cell—The grass-covered disposal cell surface was in excellent condition. There was no
3A evidence of slumping, settling, erosion, or other modifying processes. The grass was mowed in accordance with the LTSP. Noxious and invasive weeds continue to be successfully controlled through a combination of mowing and spot-spraying.

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. No indications of diminished rock durability were noted. Woody vegetation in the diversion ditches continues to be controlled by cutting and spraying.

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
3B LTSP. Vegetation management continues to be successfully implemented. Control of invasive species identified through physical site inspections, combined with mowing the grassland for weed control, has proven to be effective.

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. 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) (PL–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. No new development or changes in land use were observed that would affect the safety or security of the site.

It was noted during the inspection that large piles of fill material had been placed on Area C by the property owner. The placement of the fill does not violate any institutional controls connected with the property. A minimum of 20 feet of clearance is being maintained to DOE

groundwater monitoring wells. Post-inspection discussions with the property owner indicate that the placement of additional fill material on the property is not anticipated at this time.

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.

3.3.2 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 2011.

3.3.3 Routine Maintenance and Repairs

In 2011, 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, plugged and abandoned an unused groundwater monitoring well, and performed routine maintenance at the remaining five groundwater monitoring wells, including installing drain holes in the protective casings, installing identification tags, installing concrete pads, and installing or repairing protective bollards.

3.3.4 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 (POC) 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 POC wells (0412, 0413, and 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 (POE) 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). Routine field measurements are collected, water levels measured, and uranium concentrations determined annually.

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 no pose an unacceptable risk to human health and the environment.

Monitoring Results—DOE conducted groundwater monitoring in October 2010, and results were not available in time to be included in the 2010 compliance report. Therefore, the results from 2010 are presented in this report. DOE also conducted groundwater monitoring in October 2011. Results from October 2011 are not available for this report, but they will be provided in the 2012 compliance report.

Analytical results for groundwater and surface water monitoring are presented below. Time-concentration plots for uranium, from 1995 through 2010, are shown in Figure 3–2 for groundwater and in Figure 3–3 for surface water. The results of the 2010 monitoring demonstrate continued compliance with established site standards.

Groundwater—Uranium concentrations in 2010 were considerably below the established ACL (Figure 3–2). With the exception of monitoring wells 0412 and 0413, uranium concentrations in 2010 also were below the MCL.

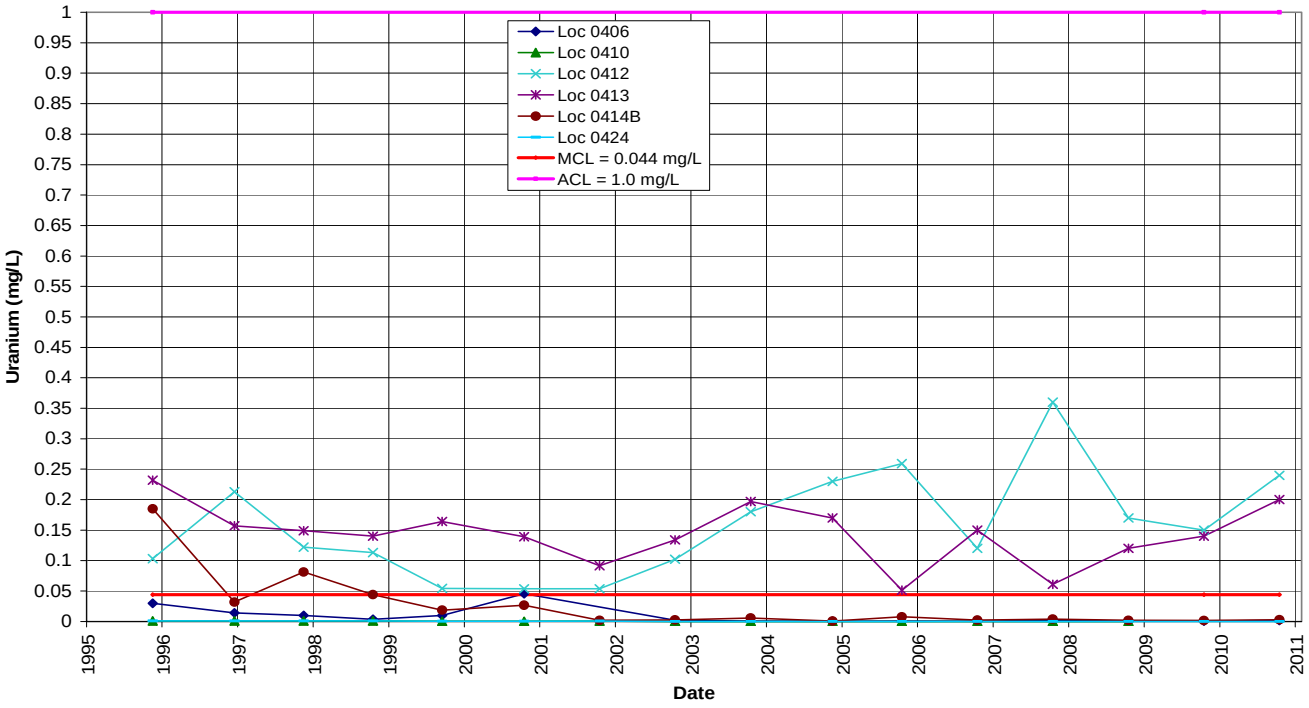

Figure 3–2. Time-Concentration Plot of Uranium in Groundwater at the Canonsburg Disposal Site

Surface Water—Only one surface water location (0602) is sampled under the revised LTSP. The uranium concentration of surface water at location 0602 in 2010 remained below the target concentration of 0.01 mg/L (Figure 3–3).

Evaluation of Monitoring Efforts—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 POE 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.

3C 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. The assessment is currently undergoing NRC review.

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

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 2011.

3.3.6 Photographs

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

Photograph Location Number	Azimuth	Photograph Description
PL–1	45	Fill material on Area C property.
PL–2	135	Vegetation-free corridor along base of perimeter fence.
PL–3	360	Prior location of monitoring well 0410.
PL–4	135	Monitoring well 0413.
PL–5	215	Contrast between riprap stream bank, where vegetation is managed, and non-riprap stream bank, where vegetation is not managed.

CAN 10/2011. PL–1. Fill material on Area C property.

CAN 10/2011. PL–2. Vegetation-free corridor along base of perimeter fence.

CAN 10/2011. PL–3. Prior location of monitoring well 0410.

CAN 10/2011. PL–4. Monitoring well 0413.

CAN 10/2011. PL–5. Contrast between riprap stream bank, where vegetation is managed, and non-riprap stream bank, where vegetation is not managed.

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