2.0 Burrell, Pennsylvania, Disposal Site

2.1 Compliance Summary

The Burrell, Pennsylvania, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site was inspected on October 22, 2014. No evidence of erosion or slope instability was observed on the disposal cell. There was some minor fence damage along the south fence line due to fallen trees, and some cracked or broken concrete monitoring well pads; these features will be repaired. An additional locking feature will be added to the entrance gate to prevent or deter unauthorized access. Routine vegetation management, consisting of herbicide treatments and mowing of noxious and invasive plants, continued in 2014. Inspectors identified no other maintenance needs or cause for a follow-up inspection.

Groundwater and seep monitoring results from samples collected in November 2013 indicate the disposal cell continues to isolate the contaminated waste from the groundwater environment.

2.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the *Long-Term Surveillance Plan for the U.S. Department of Energy, Burrell Vicinity Property Blairsville, Pennsylvania* (LTSP) (GJO-2002-331-TAR, U.S. Department of Energy [DOE], April 2000) and in procedures that DOE established to comply with the requirements of Title 10 *Code of Federal Regulations* Part 40.27 (10 CFR 40.27). Table 2-1 lists these requirements.

Table 2-1. License Requirements for the Burrell Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 3.3 and 3.4	Section 2.4
Follow-Up Inspections	Section 3.5	Section 2.5
Maintenance and Repairs	Section 3.6	Section 2.6
Emergency Measures	Section 3.6	Section 2.7
Groundwater and Seep Monitoring	Section 3.7	Section 2.8

2.3 Institutional Controls

The 72-acre site (Figure 2-1) is owned by the United States of America and was accepted under the U.S. Nuclear Regulatory Commission (NRC) general license (10 CFR 40.27) in 1994. DOE is the licensee and, in accordance with 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: perimeter warning signs, a site perimeter fence, and locked gates.

2.4 Inspection Results

The site, near Blairsville, Pennsylvania, was inspected on October 22, 2014. The inspection was conducted by M. Miller and K. Broberg of Stoller Newport News Nuclear, Inc. (SN3), a wholly owned subsidiary of Huntington Ingalls Industries, Inc. SN3 is the DOE Legacy Management Support contractor. C. Carpenter (DOE Site Manager), C. Rajkovich of the Pennsylvania Department of Environmental Protection (Pennsylvania DEP), and T. Biller of Lawn RX 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 chapter refer to items summarized in Table ES-1 of the "Executive Summary."

2.4.1 Site Surveillance Features

Figure 2-1 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 in Figure 2-1 by photograph location (PL) numbers.

2.4.1.1 Access Road, Entrance Gate, and Entrance Sign

An access road leads from Strangford Road, along a DOE right-of-way through the Burrows' property (Tract 201-E) and across DOE's leased crossing over Norfolk Southern Railroad tracks, to the locked entrance gate in the east end of the chainlink perimeter fence. The access road was easily passable in a sport utility vehicle; however, use of a low-clearance passenger car is not recommended. The entrance gate and the entrance sign were in good condition. An additional locking feature will be added to the entrance gate to prevent or deter unauthorized access.

Personnel associated with commercial interests use the access road for access to the railroad tracks and several nearby natural gas wells. Local residents historically have used the area along the DOE access road right-of-way for hunting, target practice, riding of all-terrain vehicles, and unpermitted dumping. Efforts to block unauthorized use of the access road have been unsuccessful, and DOE removed its former gate along Strangford Road in 2003.

2.4.1.2 Perimeter Fence and Perimeter Signs

The chainlink perimeter fence that encircles the site was replaced in 2007. At the time of the 2014 inspection the fence had minor damage at several locations along the south fence line due to fallen trees (PL-1, PL-2, and PL-3). Overall, however, the fence is functional and in good condition, and the personnel gates were locked and in good condition.

Several of the fence perimeter signs have bullet holes but remain legible. Bullet holes in the perimeter fence signs were the only evidence of trespass noted during the inspection.

2.4.1.3 Site Markers

One granite site marker is present at the site. It is located just inside the main entrance gate and was in excellent condition (PL-4).

2.4.1.4 Survey Monuments and Boundary Monuments

There are three survey monuments at the site. White PVC pipe has been installed near survey monuments SM-100 and SM-101 to aid in their location (PL-5 and PL-6). Although the PVC pipe for SM-100 was located, the actual monument was not because it was apparently covered with soil (PL-7). A metal detector will be used during the 2015 inspection to locate the monument.

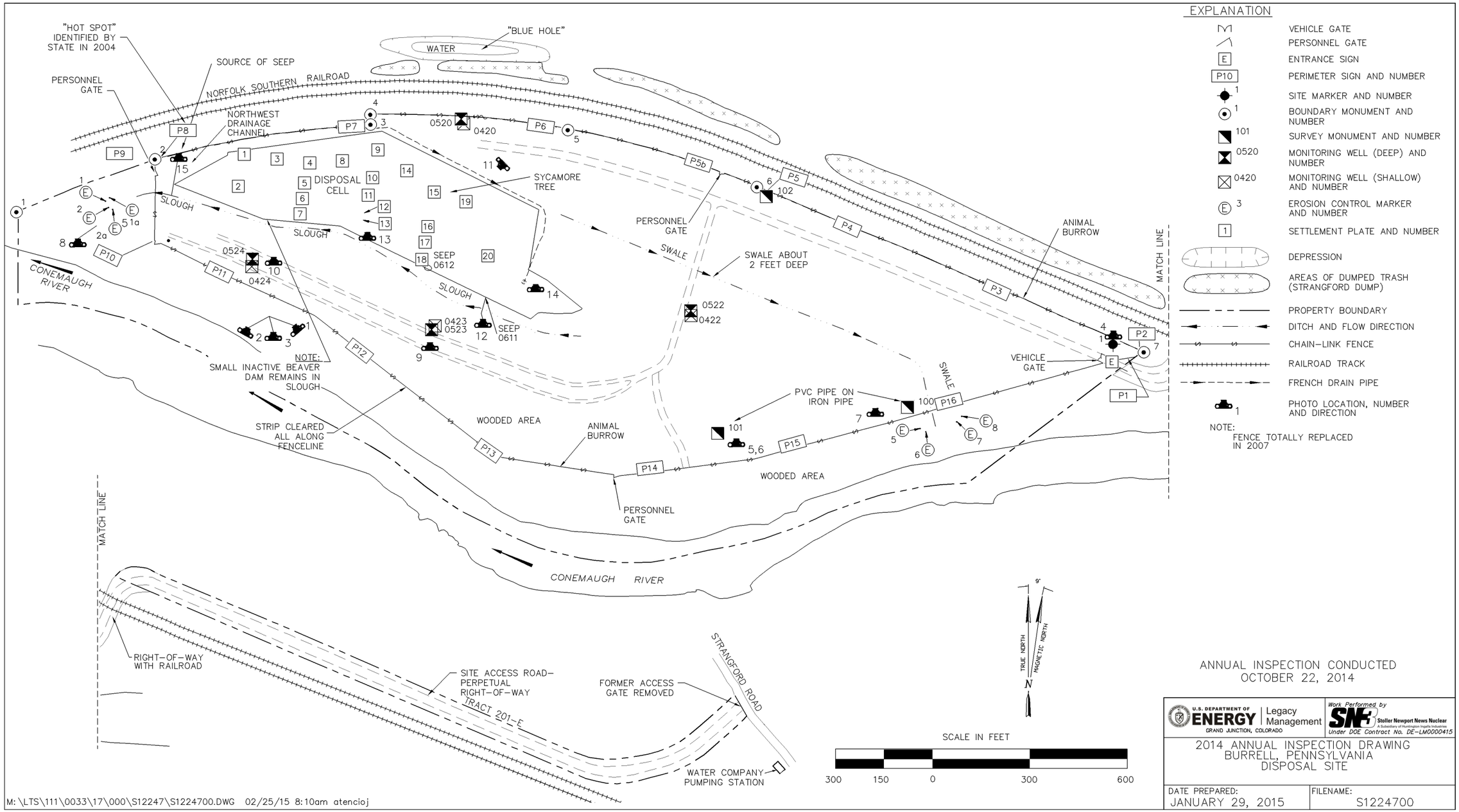

Figure 2-1. 2014 Annual Inspection Drawing for the Burrell Disposal Site

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Seven boundary monuments mark the north property boundary. Six of the seven boundary monuments, positioned along the perimeter fence, were located during the inspection and were in good condition. Boundary monument BM-1, which is located west of the disposal cell, was not found due to the dense vegetation in the area. An effort will be made in 2015 to clear a path to this monument.

2.4.1.5 Erosion Control Markers

There are eight erosion control markers at the site. All of the markers were located and were in good condition (PL-8).

2.4.1.6 Monitoring Wells

All wells encountered during the inspection were properly locked. The concrete pad around the surface casing of monitoring well 0523 is broken (PL-9). A few of the monitoring wells do not have a concrete pad (PL-10). The well pads will be repaired or installed as appropriate prior to the next sampling event in 2018.

2.4.2 Inspection Areas

In accordance with the LTSP, the site is divided into four inspection areas (referred to as "transects" in the LTSP) to ensure a thorough and efficient inspection. The inspection areas are: (1) the disposal cell, (2) the area adjacent to the disposal cell, (3) the site perimeter, and (4) the outlying area, including the access road that leads to the site.

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

2.4.2.1 Disposal Cell

The 5-acre disposal cell was completed in 1987. No indications of cell instability (e.g., slumping, bulging, or differential settlement) were observed (PL-11). Rock quality remains good, with no evidence of riprap degradation. Seep 0611 (located on the south side slope of the disposal cell) was flowing during the inspection (PL-12).

Trees and large shrubs grow on the top and slopes of the cell cap, including sycamore, maple, elm, cherry, aspen, willow, and catalpa trees (PL-13). Some of the trees are beginning to get rather large, including a sycamore that is noted on the inspection map.

Vegetation control (including woody vegetation) on the disposal cell is not required. A screening-level risk assessment conducted by DOE from 1996 to 1997 determined that plant succession on the disposal cell does not present a significant or credible risk to human health or the environment and may, by evapotranspiration, improve the long-term performance of the disposal cell. NRC suggested that DOE reevaluate the effects of vegetation on cover performance before 2017 to confirm performance parameters and predictions. In 2008, DOE prepared a vegetation management plan for the site that included control of noxious and invasive vegetation on the cell cap for the purpose of facilitating inspection activities. The issue of vegetation growth on the cell cap will be revisited before the end of 2017 to determine if

allowing continued vegetation growth on the cell cap remains protective of human health and the environment, and if it interferes with the ability of inspectors to determine cell cap stability during inspections.

2A Although vegetation is allowed to grow on the disposal cell, noxious weeds and noxious woody vegetation are treated with herbicide. Ongoing management efforts are effective at limiting the spread of Japanese knotweed, spotted knapweed, tree of heaven, amur honeysuckle, and multiflora rose.

2.4.2.2 Area Adjacent to the Disposal Cell

A French drain was installed north of the disposal cell in 1998 to prevent ponding of water next to the cell. The outlet for the French drain, located in the southeast corner of the disposal cell, was in good condition (PL-14). Prior to installation of the drain, it was thought that seeps present along the south slope of the disposal cell were being recharged by the ponded rainwater and snowmelt. Water has not been observed flowing from the outlet of the French drain and, up until 2010, no water was observed flowing from the seeps on the south slope of the cell since the French drain was installed. In spring 2010, a seep was observed on the south side of the disposal cell (Seep 0611).

A small inactive beaver dam remains in the slough south of the disposal cell. The dam appears to remain inactive as no evidence of recent activity (animal tracks, new cuts, etc.) around the dam was observed during the inspection.

Vegetation management activities are conducted on the balance of the site to control the extent of noxious and invasive plants across the site. The combination of spot herbicide application and mowing is generally effective in controlling the plants. When necessary, bare spots resulting from herbicide applications are reseeded.

2.4.2.3 Site Perimeter

An active seep is located near the north security fence, about 60 feet east of perimeter sign P8. The seep was flowing during this year's inspection, and the flow appeared to be about the same as last year (PL-15). This area will continue to be monitored to determine if the seep poses a threat to the integrity of the disposal cell. The water for the seep along the fence line appears to be coming from bluffs north of the railroad tracks.

2.4.2.4 Outlying Area

The area beyond the site boundary was visually examined for signs of erosion, development, and other changes that might affect the site. There were no activities in the immediate vicinity that would impact the site.

North of the site, a dirt road parallels the railroad tracks and provides access to a long, narrow wooded area that has been used as an illegal dump in the past. No new fresh piles of trash were observed during the inspection. The dump is not a threat to the disposal site but is an indication of the overall level of activity near the disposal site and may be a predictor of vandalism. For this reason, inspectors will continue to note conditions at the dump.

In 2004, a representative from Pennsylvania DEP pointed out to inspectors the presence of a "hot spot" (having gamma radiation levels of 5 millirems per hour) in the rock ballast adjacent to the railroad tracks northeast of perimeter sign P8. After the inspection, DOE checked site records and determined that the area in question was addressed in a Uranium Mill Tailings Remedial Action Project property completion report. Supplemental standards were applied to contamination beneath the tracks because the benefit of removal did not justify the cost, and the contamination did not pose a risk. DOE communicated the results of the records search to the state in late 2004. The hot spot was discussed with State representatives again in 2006 and there were no concerns because the supplemental standards application established that under current land use there is negligible risk and land use is stable. The area is marked on the site inspection map for future reference.

2.5 Follow-Up 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 inspection was identified.

2.6 Maintenance and Repairs

Routine vegetation management was conducted in 2014 (mowing and herbicide treatments). The inspection identified the need for minor fence repairs and well pad repairs, and the addition of a locking feature on the entrance gate.

2.7 Emergency Measures

Emergency measures are the actions that DOE will take in response to "unusual damage or disruption" that threaten or compromise site safety, security, or integrity. DOE will contain or prevent dispersal of radioactive materials in the unlikely event of a breach in cover materials. No need for emergency measures was identified.

2.8 Groundwater and Seep Monitoring

2B In accordance with the LTSP, DOE monitors groundwater as a best management practice once every 5 years to evaluate the disposal cell's performance. The most recent monitoring event occurred in November of 2013, and the results were not available in time to be included in the 2013 compliance report. Therefore, the results from 2013 are presented in this report.

The groundwater monitoring network consists of eight wells (in four pairs) and two seeps that are monitored for four target analytes: lead, molybdenum, selenium, and uranium. The wells in the monitoring network are listed in Table 2-2. In 40 CFR 192, Table 1, Subpart A, the U.S. Environmental Protection Agency established maximum concentration limits (MCLs) for these analytes in groundwater (Table 2-3). The MCLs are used as indicators for evaluating cell performance.

Table 2-2. Groundwater Monitoring Well Network at the Burrell, Pennsylvania, Disposal Site

Monitoring Well Pair	Hydrologic Relationship
0420 & 0520	Upgradient or background
0422 & 0522	Crossgradient
0423 & 0523	Downgradient
0424 & 0524	Downgradient

Table 2-3. Maximum Concentration Limits for Groundwater and Seep Constituents at the Burrell, Pennsylvania, Disposal Site

Constituent	MCL[a] (mg/L)
Lead	0.05
Molybdenum	0.1
Selenium	0.01
Uranium	0.044

mg/L = milligrams per liter
[a] 40 CFR 192, Table 1, Subpart A.

Each pair of wells consists of a shallow well completed in unconsolidated fill and alluvium (400-series wells), and a deeper well completed in the shallow bedrock of the Casselman Formation (500-series wells). In addition to the wells, two seeps at the bottom of the south side slope of the disposal cell (0611 and 0612) are also sampled if they yield sufficient water. Seep 0612 was not sampled in 2013 because it was dry.

Concentrations of lead in groundwater in both the shallow alluvial wells and the deeper bedrock wells remain well below the MCL of 0.05 milligram per liter (mg/L). 2013 results from all locations were more than an order of magnitude below the MCL (Figure 2-2).

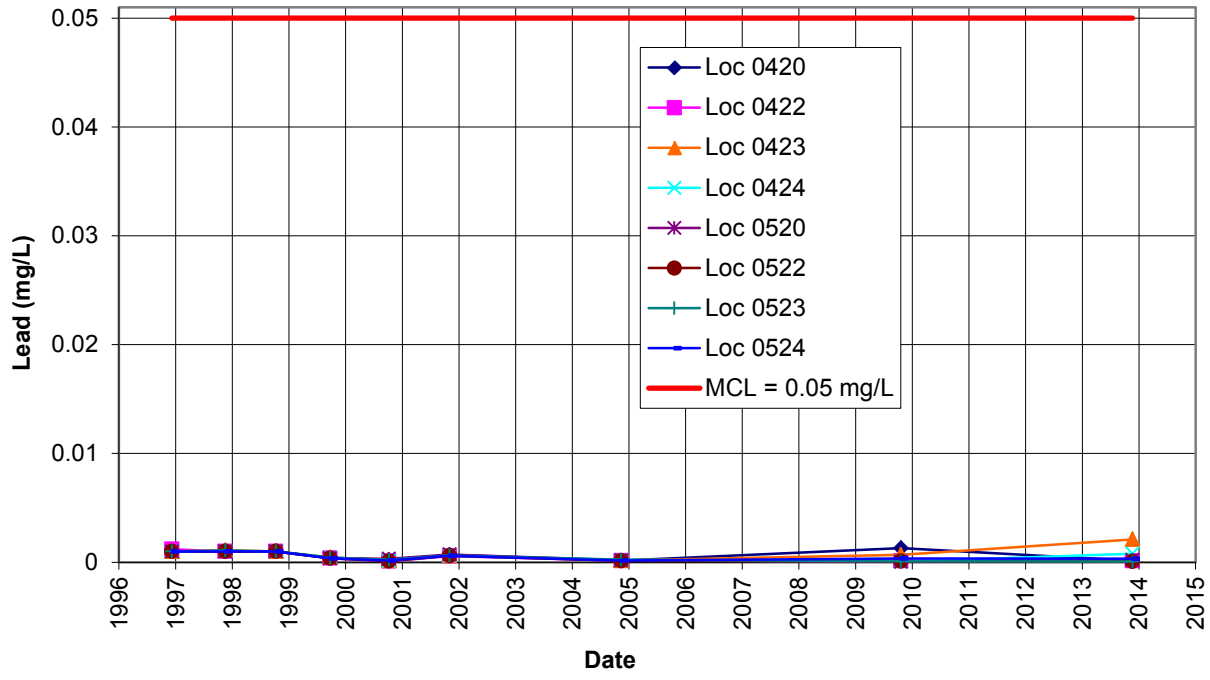

Figure 2-2. Lead Concentrations in Groundwater

Concentrations of molybdenum in groundwater in both the shallow alluvial wells and the deeper bedrock wells remain well below the MCL of 0.1 mg/L. 2013 results from all locations, except down gradient wells 0422, 0423, and 0424, were more than an order of magnitude below the MCL and near or below the laboratory detection limit. Concentrations in wells 0422, 0423, and 0424 were about an order of magnitude below the MCL (Figure 2-3).

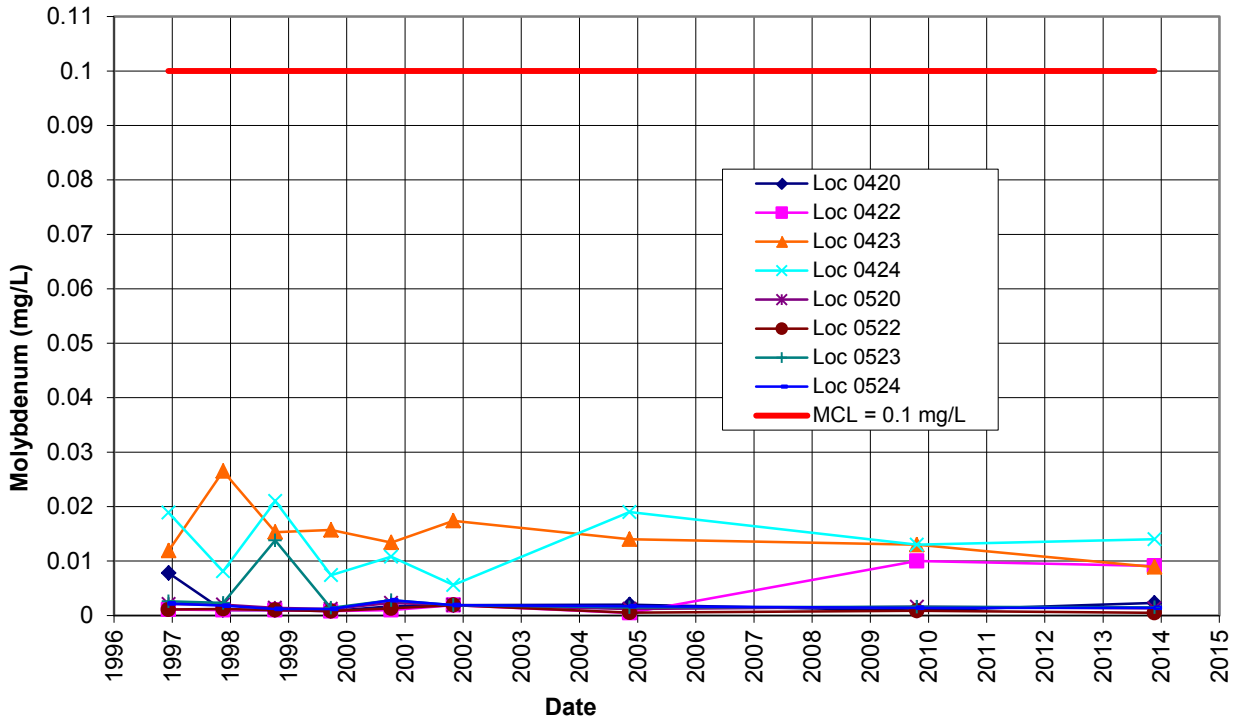

Figure 2-3. Molybdenum Concentrations in Groundwater

Concentrations of selenium in groundwater in both the shallow alluvial wells and the deeper bedrock wells remain well below the MCL of 0.01 mg/L. 2013 results from all locations were more than two orders of magnitude below the MCL and approached the laboratory detection limit (Figure 2-4).

Concentrations of uranium in groundwater in both the shallow alluvial wells and the deeper bedrock wells remain well below the MCL of 0.044 mg/L. 2013 results from all locations were an order of magnitude or more below the MCL and approach the laboratory detection limit (Figure 2-5).

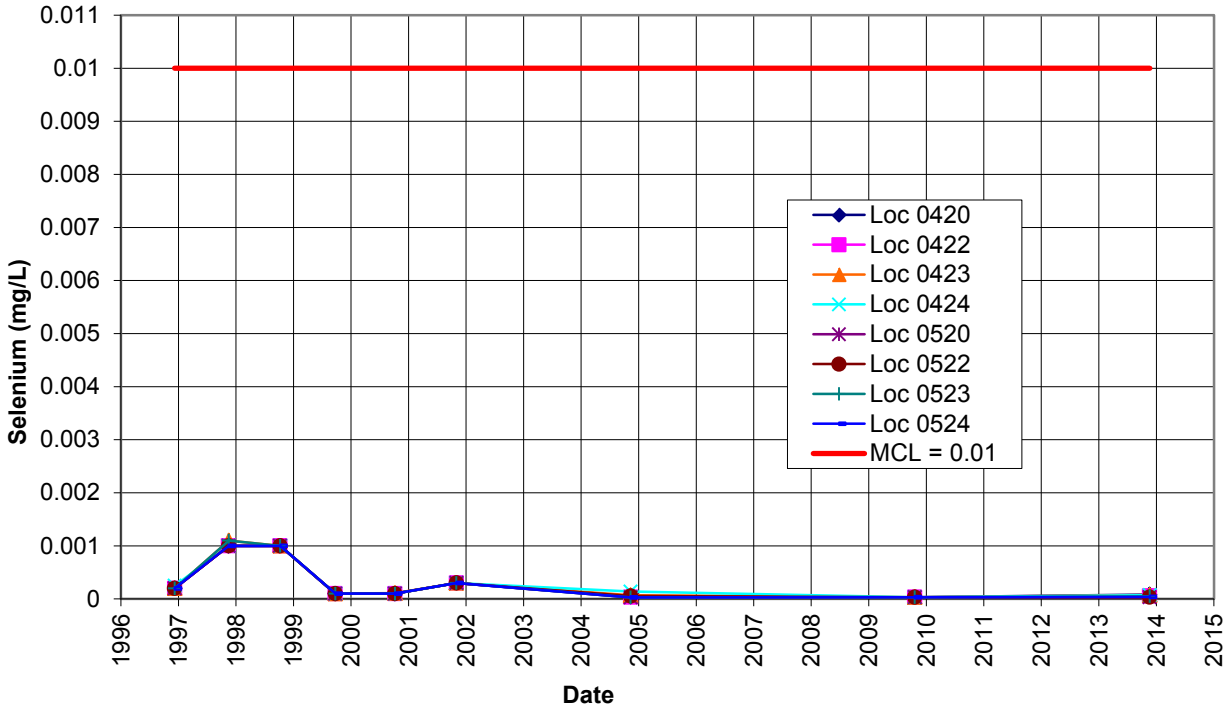

Figure 2-4. Selenium Concentrations in Groundwater

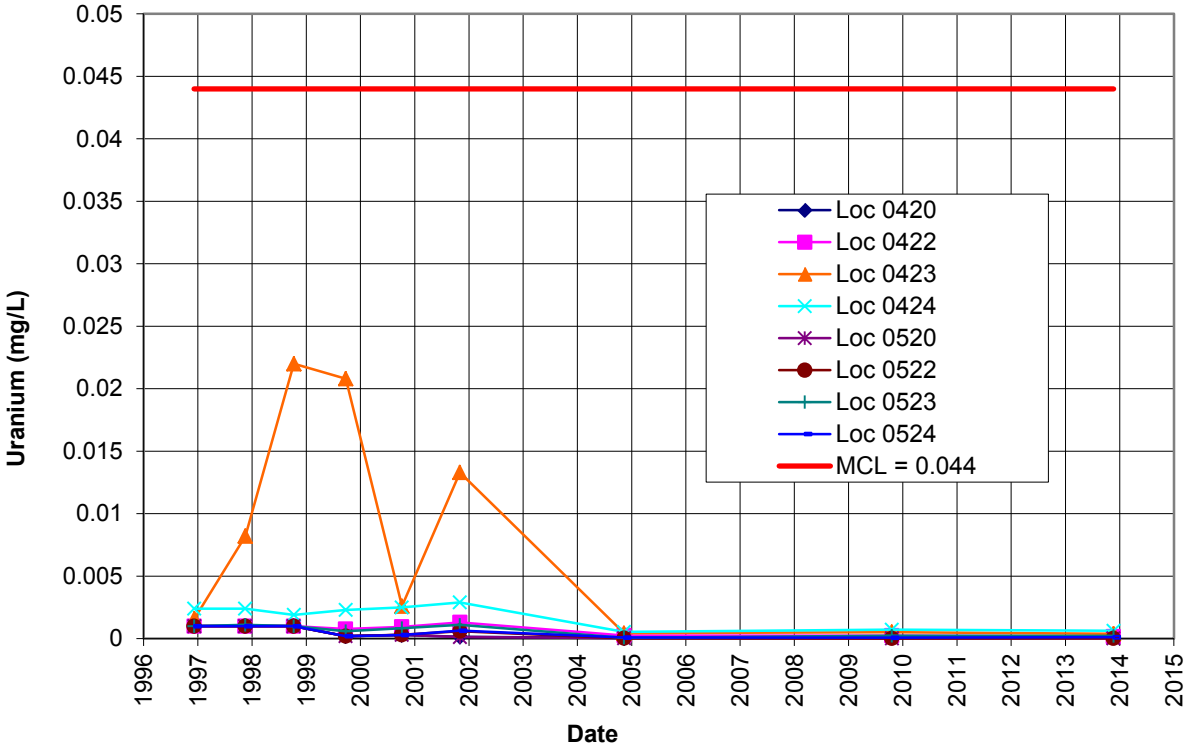

Figure 2-5. Uranium Concentrations in Groundwater

Table 2-4 provides 2013 sample results for seep 0611. All concentrations were well below their respective MCLs.

Table 2-4. Seep 0611 Sample Results

Constituent	2013 Concentration (mg/L)
Lead	0.00061
Molybdenum	0.0073
Selenium	0.000077
Uranium	0.00032

The concentrations of the four target analytes remain significantly below their respective MCLs and show no upward trends. Also, the results show that groundwater downgradient from the disposal cell is not significantly degraded relative to upgradient or background groundwater. Therefore, the disposal cell effectively isolates the contaminated waste from the groundwater environment.

In accordance with the LTSP, the groundwater and seeps are sampled every 5 years. The next sampling event is scheduled for 2018. After every sampling event, DOE will review the data for trends or significant changes and will review the need to continue monitoring. DOE may determine, with NRC concurrence, to discontinue monitoring or alter the monitoring frequency.

2.9 Photographs

Photograph Location Number	Azimuth	Photograph Description
PL-1	320	Slight damage to top rail of perimeter fence.
PL-2	30	Damage to perimeter fence.
PL-3	0	Damage to top rail of perimeter fence.
PL-4	0	Burrell site marker.
PL-5	0	Survey monument SM-101.
PL-6	0	PVC marker for survey monument SM-101.
PL-7	0	PVC marker for survey monument SM-100.
PL-8	0	Erosion control marker 2A.
PL-9	0	Broken concrete around base of monitoring well 0523.
PL-10	0	Base of monitoring well 0524.
PL-11	225	Northeast slope of disposal cell.
PL-12	0	Seep 0611 (flowing).
PL-13	0	Catalpa tree on south slope of disposal cell.
PL-14	0	Outlet of French drain.
PL-15	0	Active seep northwest of disposal cell.

BUR 10/2014. PL-1. Slight damage to top rail of perimeter fence.

BUR 10/2014. PL-2. Damage to perimeter fence.

BUR 10/2014. PL-3. Damage to top rail of perimeter fence.

BUR 10/2014. PL-4. Burrell site marker.

BUR 10/2014. PL-5. Survey monument SM-101.

BUR 10/2014. PL-6. PVC marker for survey monument SM-101.

BUR 10/2014. PL-7. PVC marker for survey monument SM-100.

BUR 10/2014. PL-8. Erosion control marker 2A.

BUR 10/2014. PL-9. Broken concrete around base of monitoring well 0523.

BUR 10/2014. PL-10. Base of monitoring well 0524.

BUR 10/2014. PL-11. Northeast slope of disposal cell.

BUR 10/2014. PL-12. Seep 0611 (flowing).

BUR 10/2014. PL-13. Catalpa tree on south slope of disposal cell.

BUR 10/2014. PL-14. Outlet of French drain.

BUR 10/2014. PL-15. Active seep northwest of disposal cell.

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