

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 28, 2015. With the exception of a few minor maintenance items (i.e., a missing site entrance sign and a tree limb lying on the perimeter fence) the Burrell site is in excellent condition. No evidence of erosion or slope instability was observed on the disposal cell.

An effective vegetative management program that aligns with requirements set forth within the Long-Term Surveillance Plan (LTSP) remains successful. The continued combination of spot herbicide application and more frequent mowing has greatly reduced the extent of noxious weeds, including teasel, poison hemlock, and common reed. The approach used for control of Japanese knotweed is achieving desired results. The presence of resprouting weeds and rosettes indicates that continued diligence is needed. It is recommended that the spot-spray/mow process continue.

An eco-friendly pilot-project for reseeding distressed areas along the southern perimeter fence (that began in 2009) continues to be a success. Herbaceous cover in the pilot-project area is well-established, and it appears to have reduced re-establishment of noxious weeds following herbicide application. It is recommended that additional seeding be undertaken, as deemed appropriate, following herbicide application for noxious weeds sitewide.

Groundwater quality monitoring is conducted on a 5-year schedule. Sampling was last conducted in 2013. The next sampling event is planned for 2018. Groundwater monitoring results from samples collected in November 2013 indicated that the disposal cell continues to isolate the contaminated waste from the groundwater environment. Inspectors identified no other maintenance needs or cause for a follow-up or contingency inspection

2.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the revised *Long-Term Surveillance Plan for the U.S. Department of Energy Burrell Vicinity Property, Blairsville, Pennsylvania* (GJO-2002-331-TAR, U.S. Department of Energy [DOE], April 2000) and in procedures established by DOE to comply with the requirements of Title 10 *Code of Federal Regulations* Section 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 or Contingency Inspections	Section 3.5	Section 2.5
Maintenance and Emergency Measures	Section 3.6	Section 2.6 and 2.7
Groundwater and Surface Water Monitoring	Section 3.7	Section 2.8.1

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 physical features that are inspected annually: perimeter warning signs, a site perimeter fence, and locked gates.

2.4 Inspection Results

S. Smith and K. Broberg of the DOE Legacy Management Support contractor conducted the inspection on October 28, 2015. C. Carpenter (DOE Site Manager), D. Shearer (Pennsylvania Department of Environmental Protection), and T. Biller (Lawn RX) also participated in the inspection. Lawn RX is the subcontractor conducting herbicide services.

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.”

2.4.1 Site Surveillance Features

The locations of site surveillance features are shown in Figure 2-1. 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 2-1 by photograph location (PL) numbers.

2.4.1.1 Access Road, Entrance Gates, 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 entrance gate in the east end of the chainlink perimeter fence. The access road was easily passable in a sport utility vehicle; use of a low-clearance passenger car is not recommended.

Local residents historically have used the area along the DOE right-of-way for unpermitted dumping, hunting, target practice, and riding of all-terrain vehicles. Personnel associated with commercial interests use the road for access to the railroad tracks and several nearby natural gas wells. Previously, an attempt was made to control access across the right-of-way by maintaining a gate at Strangford Road and installing a guardrail on both sides of the gate. Local residents complained that the guardrail blocked access to parking areas and, consequently, DOE removed several sections. After years of replacing locks and after the gate was damaged beyond repair in 2002, DOE requested NRC concurrence in removing the gate and establishing institutional control for the site at the entrance gate of the perimeter fence. NRC concurred on April 28, 2003, and the gate along Strangford road was removed in fall 2003.

During this year’s inspection, site entrance gates were in good condition and properly locked. The south personnel gate (near perimeter sign P14) is in need of a new lock. Arrangements will

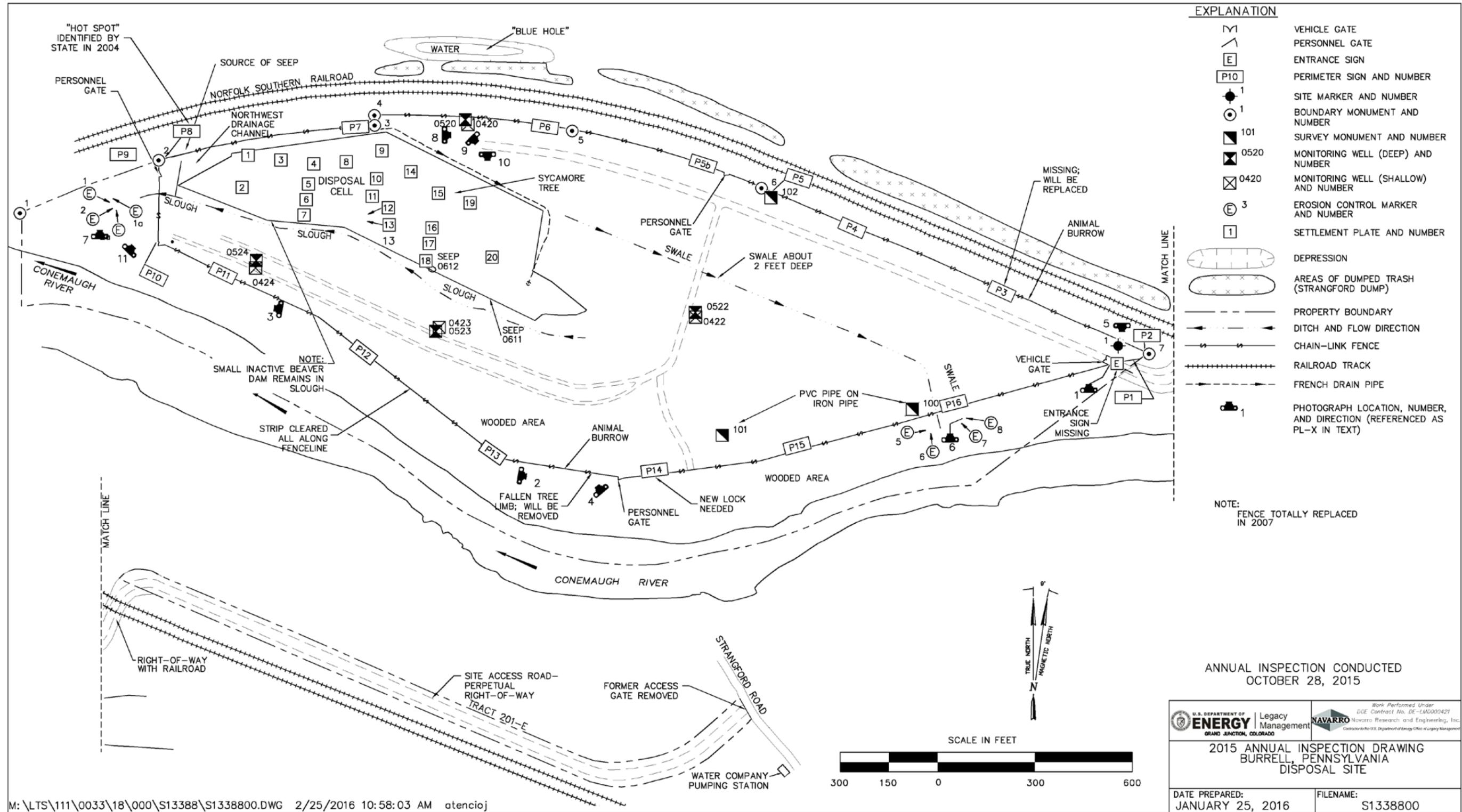


Figure 2-1. 2015 Annual Inspection Drawing for the Burrell Disposal Site

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be made in 2016 to have the existing lock replaced with a new waterproof lock. It was noted during the inspection that the main entrance gate could be further secured by installing a lockable J-post. A pipe is already installed in the ground beneath the gates that could easily receive the J-post (PL-1). The site entrance sign was missing from the main site entrance gate. A J-post will be installed and the site entrance sign will be replaced.

2.4.1.2 Perimeter Fence and Perimeter Signs

The chainlink perimeter fence that encircles the site was replaced in 2007, and it remains in good condition. The site herbicide subcontractor is doing an excellent job keeping the fence line clear of vegetation, which should prolong the life of the fence (PL-2 and PL-3).

The south fence received minor damage at several locations in 2014 due to fallen trees. All of the damage areas identified in the 2014 inspection report were repaired in 2015. A new area of minor damage was noted in 2015 due to another tree limb falling across the top rail of the south fence (PL-4). The limb was too large for inspectors to safely remove. The site maintenance subcontractor will remove the limb from the fence. Additional repairs to the fence are not needed.

As reported in previous inspection reports, several of the fence perimeter signs are damaged with bullet holes (e.g., P4) but remain serviceable. Perimeter sign P3 could not be located, and it will be replaced. Bullet holes in the perimeter fence signs were the only evidence of trespass noted during the inspection.

2.4.1.3 Site Markers

The Burrell site has one site marker. It is just inside the main entrance gate and was in excellent condition (PL-5).

2.4.1.4 Survey Monuments and Boundary Monuments

There are three survey monuments and seven boundary monuments at the Burrell site. All three survey monuments (SM-100, SM-101, and SM-102) are located at points on the property that originally afforded a sweeping view of the site during construction. Several years ago inspectors installed tall pieces of white PVC pipe near SM-100 and SM-101 to aid in locating them. Although the PVC pipe for SM-100 was located in 2014, the actual monument was not. Given the poor weather conditions encountered during this year's inspection, an effort to locate the monument using a metal detector was not made. A metal detector and GPS instrument will be used in 2016 to locate the marker.

Seven boundary monuments are located along the north perimeter fence. Five of the seven boundary monuments were located during the inspection and observed to be in good condition. Boundary monument BM-1, which is located to the west of the disposal cell, was not located due to the dense vegetation in the area. The site maintenance subcontractor will clear vegetation from around this monument. Boundary monument BM-5, which is located along the north fence line, also could not be located. A metal detector and GPS instrument will be used in the next inspection to locate that monument.

2.4.1.5 Erosion Control Markers

There are eight erosion control markers at Burrell. All eight erosion control markers were located and were in good condition (PL-6 and PL-7).

2.4.1.6 Monitoring Wells

All wells encountered during the inspection were properly locked (PL-8). The interiors of the monitoring wells were not inspected this year. The interiors were last inspected by the water sampling crew in November 2013.

As identified during the 2014 inspection, the concrete base/pad located around the surface casing of monitoring well 0523 is cracked. A few of the monitoring wells do not have a concrete base/pad (i.e., MW-0424). During the next scheduled sampling round in 2018, well pads will be repaired or installed as deemed appropriate.

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

No indications of cell instability (e.g., slumping, bulging, or differential settlement) were noted by the inspectors (PL-9, PL-10, and PL-11). Rock quality remains good; degradation of the riprap was not evident. Due to the rain and slippery conditions, inspectors did not walk across the riprap cover to inspect seep 0611 (located on the south side slope of the disposal cell).

Vegetation control (including woody vegetation) on the disposal cell is not required for protection of human health and the environment. A screening-level risk assessment conducted by DOE from 1996 to 1997 determined that plant succession on the disposal cell does not present significant or credible risk to human health or the environment and might, by evapotranspiration, improve the long-term performance of the disposal cell.

NRC suggested that DOE reevaluate the effects of vegetation on cover performance in 10 or 20 years following the report, (which, based on 1997, would be by the year 2017) to confirm performance parameters and predictions. DOE is planning to conduct a follow-up assessment on the effect of vegetation on cover performance in 2016. The assessment will revisit the issue of vegetation growth on the cell cap to determine whether vegetation growth on the cell cap remains protective of human health and the environment, and whether it interferes with the ability of inspectors to determine cell cap stability during inspections.

Trees and large shrubs grow on the top and slopes of the cell cap. The trees are beginning to be rather large. A sycamore located on the top of the cell cap had a 14-inch circumference trunk in 2009 and a 16-inch circumference trunk in 2012 (as measured 4.5 feet above the ground). The location of this tree is noted on the inspection map, and the tree is identified with a survey ribbon so that future inspectors can revisit this tree and record additional growth. Due to poor weather conditions during this year's inspection (i.e., slippery riprap), inspectors did not venture on the riprap to check the tree.

2A Although vegetation is allowed to grow on the disposal cell, the cell is sprayed for noxious weeds. In 2008, a Vegetation Management Plan was issued for the Burrell site that included control of noxious and invasive vegetation on the cell cap for the purpose of facilitating inspection activities. Vegetation management efforts are effective at limiting the spread of noxious weeds. Control of woody noxious vegetation will continue as recommended.

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 is located in the southeast corner of the disposal cell. The outlet was not flowing during the inspection. As noted below, flow from the outlet has never been observed, but given the large amount of rainfall that day, flow was expected. Water was not ponded anywhere along the French drain depression that runs parallel to the north slope of the disposal cell, indicating that the French drain was operating properly. Inspectors will continue to keep an eye on the French Drain area to verify that it is operating as designed.

Inspections dating back to 1998 indicate that, prior to installing the French drain, rainwater and snow melt would collect on the north side of the disposal cell and enter into a shallow depression located along the base of the north slope of the disposal cell. Saturated soil and wetland vegetation (cattails and purple loosestrife) were present in a 3-foot wide band along this depression. Design drawings indicated that this depression should have drained to the east, but final grading of the area around the northeast corner of the disposal cell left a high spot so the intended drainage did not occur. At the same time that water was ponding just north of the disposal cell, seeps were occurring in the south slope of the disposal cell. It was thought that the source of water for these seeps could be the ponded water north of the disposal cell. The French drain was installed in 1998 to correct this drainage problem. Water has not been observed flowing from the outlet of the French drain. Until 2010, no water was observed flowing from the seeps on the south slope of the disposal cell since the French Drain was installed. In spring 2010 however, a seep was observed on the south side of the disposal cell (seep 0611). The seep was sampled and no maximum concentration limit (MCL) exceedances were measured in the sample. Seep 0611 was not checked during this year's inspection because walking on the slippery riprap presented a work hazard.

A small inactive beaver dam remains in the slough south of the disposal cell. Inspectors did not walk down to the beaver dam during this year's inspection because of unsafe working conditions. The site herbicide contractor indicated that the dam was inactive in 2015 as no evidence of recent activity around the dam was observed (animal tracks, new cuts, etc.).

2.4.2.3 Site Perimeter

An active seep is located near the north security fence, about 60 feet east of perimeter sign P8 and west of the disposal cell. The seep was flowing during this year's inspection, and it appeared

to be about the same as last year. This area will continue to be monitored to determine whether the seep poses a threat to the integrity of the disposal cell. Conceivably, the seep could destabilize the nearby railroad embankment. The water for the seep along the fence line appears to be coming from the bluffs, north of the railroad tracks.

2.4.2.4 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. 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 dumping of trash 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 any dumping activity.

In 2004, a representative from the Pennsylvania Department of Environmental Protection 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 are 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 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.

2.6 Maintenance and Repairs

Installation of a J-post is planned on the main entrance gate to increase site security. During the inspection the site entrance sign and perimeter sign P3 were identified as missing; they will be replaced. A tree limb was found to be obstructing the south fence and will be removed. Vegetation management continues for both noxious weeds and noxious woody vegetation onsite by herbicide application following seeding. Monitoring well pads will be repaired or installed as needed.

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 emergency measures were identified in 2015.

2.8 Environmental Monitoring

2.8.1 Groundwater Monitoring

In accordance with the LTSP, DOE monitors groundwater at Burrell as a best management practice to evaluate the disposal cell's performance. The groundwater monitoring effort consists of eight wells (in four pairs) that are monitored for four target analytes: lead, molybdenum, selenium, and uranium. In 40 CFR 192, Table 1, Subpart A, the U.S. Environmental Protection Agency (EPA) has established MCLs for these analytes in groundwater. The wells in the monitoring network are listed in Table 2-2 and MCLs for the four target analytes in Table 2-3.

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

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

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

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

^aEPA MCLs as listed in 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.

Sampling is conducted on a 5-year schedule. Samples were last collected in 2013. Monitoring results from the 2013 sampling event were presented in the 2014 Inspection Report. As reported in the 2014 Inspection Report, the concentration of the four target analytes remain well below the MCLs and, in most cases, at or near the laboratory detection limit. Groundwater downgradient from the disposal cell was not significantly degraded relative to upgradient or background groundwater, and DOE concluded that the disposal cell effectively isolates its contaminated waste from the groundwater environment.

After each monitoring event, DOE reviews the data for trends or significant changes. From time to time, and with NRC concurrence, DOE will review the need to continue monitoring and may determine to discontinue monitoring or alter the monitoring frequency. The next round of groundwater sampling is scheduled for 2018. Sampling at Burrell is coordinated with sampling at the Canonsburg, Pennsylvania, and Parkersburg, West Virginia, disposal sites to improve efficiency and decrease travel costs.

2.8.2 Vegetation Management

Vegetation management activities are mostly successful in controlling the extent of noxious and invasive plants across the site. The combination of spot herbicide application and more frequent mowing is effective, with the exception of purple loosestrife. This species continues to be found in the swale located south and west of the disposal cell and the area between the toe of the north slope of the disposal cell and the French drain. Some additional loosestrife was located east of the disposal cell, in or around the swale that drains to the east. Purple loosestrife is classified as a noxious weed in Pennsylvania.

Areas of heavy infestation have left bare spots following control measures, resulting in other invasive species moving in. Therefore, it is recommended that seeding activities follow spot herbicide application in areas of heavy infestation. Seeded areas in 2009 and 2010 have established well, and similar mixes can be used to prevent recurrent establishment of noxious weeds.

Wooded areas remained heavily infested with noxious weeds. Pursuant to the vegetation management plan, the fence line and access paths remain clear.

The spot-spray/mow process across the site will be continued. The vegetation inspection map will be used as a guide for herbicide application, but it is recommended that a complete site walkdown be conducted to ensure adequate coverage. An appropriate seed mix will be broadcast in heavily infested areas following herbicide application.

2.9 Corrective Action

Corrective action is taken to correct out-of-compliance or hazardous conditions that create a potential health and safety problem or that might affect the integrity of the disposal cell or compliance with 40 CFR 192. No corrective action was identified during the inspection.

2.10 Photographs

Photo Location Number	Azimuth	Photograph Description
1	NA	Pipe in ground, vehicle gate, east side of site.
2	100	South perimeter fence line.
3	280	South perimeter fence line.
4	320	Tree limb on top of fence.
5	NA	Site marker.
6	NA	Erosion control marker ECM-8.
7	NA	Erosion control marker ECM-2A.
8	90	Monitoring well 0520.
9	135	Northeast end of the disposal cell.
10	180	North side of the disposal cell.
11	45	West side of the disposal cell



BUR 10/2015. PL-1. Pipe in ground, vehicle gate, east side of site.



BUR 10/2015. PL-2. South perimeter fence line.



BUR 10/2015. PL-3. South perimeter fence line.



BUR 10/2015. PL-4. Tree limb on top of fence.



BUR 10/2015. PL-5. Site marker.



BUR 10/2015. PL-6. Erosion control marker ECM-8.



BUR 10/2015. PL-7. Erosion control marker ECM-2A.



BUR 10/2015. PL-8. Monitoring well 0520.



BUR 10/2015. PL-9. Northeast end of the disposal cell.



BUR 10/2015. PL-10. North side of the disposal cell.



BUR 10/2015. PL-11. West side of the disposal cell