

16.0 Annual Inspection of the Shiprock, New Mexico, UMTRCA Title I Disposal Site

16.1 Compliance Summary

The Shiprock, New Mexico, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site was inspected on May 29, 2012. The disposal cell and all associated surface water diversion and drainage structures remained in good condition and were functioning as designed. Minor maintenance activities (e.g., fence repairs and debris removal) are required.

No settling, slumping, erosion, animal intrusion, riprap deterioration, or other disturbance was evident on the top and side slopes of the cell. Five open research pits, several small depressions caused by subsided historical piezocone pits, and vehicle ruts were present on the cell top. No significant changes were observed since the 2011 inspection. The research pits were covered after the inspection, and the other depressions will continue to be monitored. Several small woody shrubs were growing on the northwest side slope of the cell. Diversion channels and the outflow channel were in good condition. Vegetation appeared sparse and is not expected to obstruct drainage flow. No new erosion was evident along the terrace escarpment. No significant changes in land use associated with outlying areas were identified. The offsite portion of the outflow channel remained functional and in good condition.

All three of the site's entrance gates remained intact. All perimeter signs were present, legible, and in good condition. One pictorial entrance sign was missing from the northwest gate. Sediment had accumulated under the southwest gate. The perimeter fence, although damaged in places, was intact and functional. Inspectors placed rocks in all significant gaps that formed under the perimeter fence. Boundary monuments BM-2 through BM-6 were not found during the annual inspection; a survey team found and reestablished the missing boundary monuments after the inspection. One erosion control marker was previously damaged by a vehicle but remained functional.

No additional maintenance needs or cause for a follow-up or contingency inspection was identified.

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

16.2 Inspection Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the *Long-Term Surveillance Plan for the Shiprock Disposal Site, Shiprock, New Mexico* (DOE/AL/62350-60F, Rev. 1, U.S. Department of Energy [DOE], September 1994; 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 16-1 lists these requirements.

Table 16–1. License Requirements for the Shiprock Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 6.0	Section 16.4
Follow-Up or Contingency Inspections	Section 7.0	Section 16.5
Routine Maintenance and Repairs	Section 8.0	Section 16.6
Groundwater Monitoring	Section 5.0	Section 16.7.1
Corrective Action	Section 9.0	Section 16.8

16.3 Institutional Controls

The 105-acre disposal site is held in trust by the U.S. Bureau of Indian Affairs. The Navajo Nation retains title to and ownership of the land. The site was accepted under U.S. Nuclear Regulatory Commission 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 custody of the disposal cell and its engineered features, 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.

16.4 Inspection Results

The site, located approximately 28 miles west of Farmington, New Mexico, was inspected on May 29, 2012. L. Sheader and M. Kastens of the S.M. Stoller Corporation, the Legacy Management Support contractor at the DOE office in Grand Junction, Colorado, conducted the inspection. L. Gersey of U.S. Nuclear Regulatory Commission Region 4 observed inspection activities. D. Steckley, the DOE Office of Legacy Management site manager, and L. Benally, of the Navajo Abandoned Mine Lands/Uranium Mill Tailings Remedial Action Department, participated in the inspection. Also in attendance were C. Gauthier and S. Woods of the S.M. Stoller Corporation.

The purposes of the annual 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.

16.4.1 Site Surveillance Features

The locations of site surveillance features are shown on Figure 16–1. 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 on Figure 16–1 by photograph location (PL) numbers.

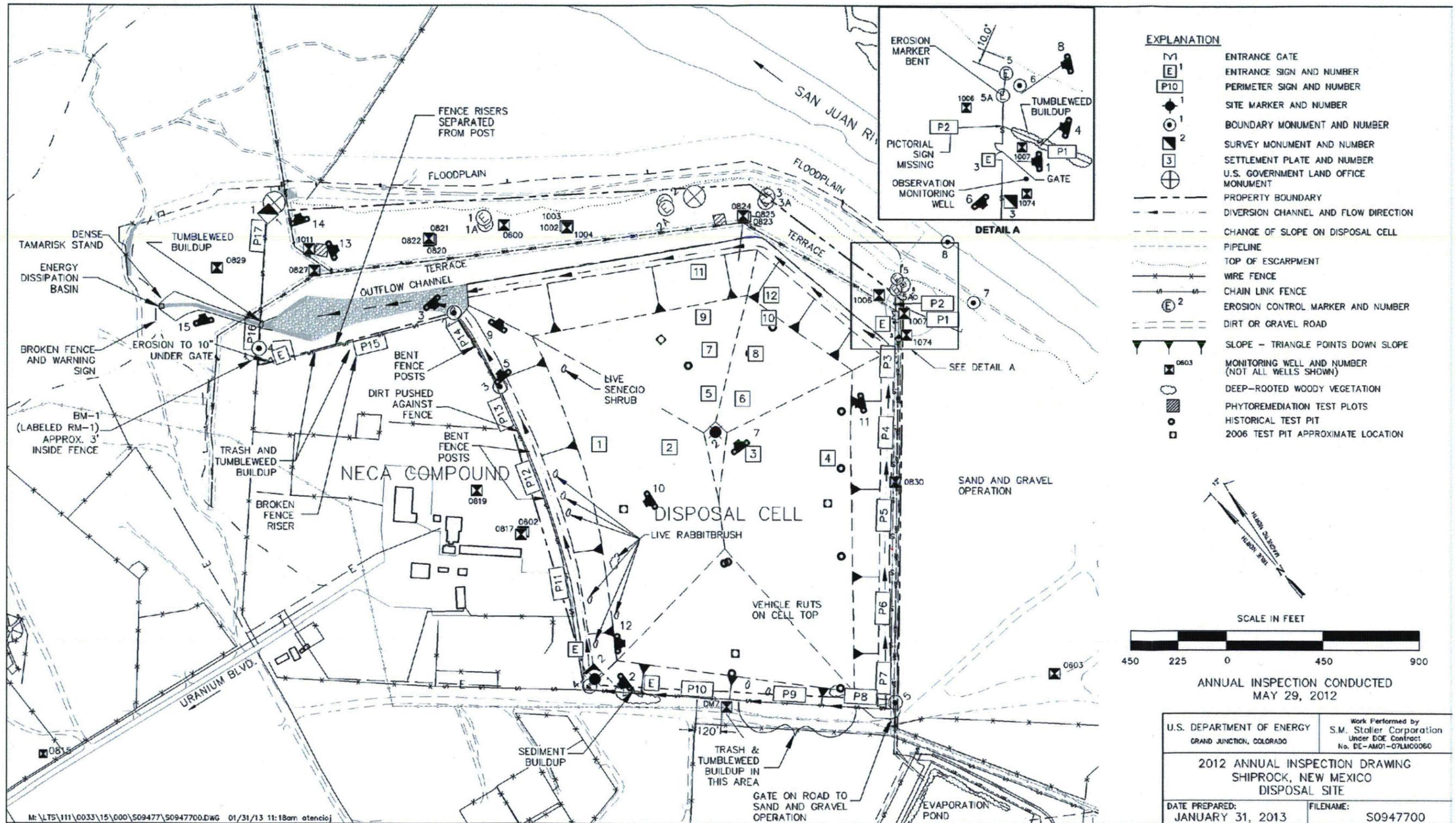


Figure 16-1. 2012 Annual Compliance Drawing for the Shiprock Disposal Site

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16.4.1.1 Entrance Gates, Entrance Signs, and Access Roads

Three gates allow entrance to the site: the east gate (the current main entrance gate near the terrace escarpment), the northwest gate (an auxiliary access gate), and the southwest gate (the former entrance gate). Near each gate, entrance signs are placed in pairs—one text and one pictorial (PL-1). The pictorial sign was missing from the northwest gate. The remaining entrance signs were in good condition; on the signs, contact information for DOE and the Navajo Abandoned Mine Lands/Uranium Mill Tailings Remedial Action Department was correct. The east and northwest gates were intact and functional. Sediment accumulated along the bottom of the southwest gate (PL-2). Access to the main entrance gate is gained by traveling through a gravel pit operated by the Navajo Engineering and Construction Authority (NECA). All access roads were in good condition.

16.4.1.2 Perimeter Fence and Perimeter Signs

As observed in previous years, the perimeter fence was intact and functional but damaged in a number of areas. Damaged fence sections reported in previous years include bent posts and bent fence fabric between perimeter signs P11 and P12, dirt mounded against the fence near P13, bent posts near P14, a broken fence riser near P15, and fence risers separated from posts between P15 and P16. New damage consists of a section of bent fence near P13; damage resulted from a large culvert placed in the adjoining NECA yard (PL-5). Damaged areas will continue to be monitored.

Trash and tumbleweeds have accumulated in many places along the perimeter fence (PL-3 and PL-4), including a section of fence across the outflow channel. These accumulations potentially represent a fire hazard and increase the possibility of damage to the fence, particularly during high winds. To improve the safety and appearance of the site the tumble weeds and trash have been removed.

There were small gaps beneath the fence, most formed by animals and wind erosion, along the site perimeter. In 2012, inspectors placed rocks in all significant gaps (PL-6).

Seventeen pairs of signs designated P1 through P17, each pair consisting of one pictorial sign and one sign with text, are located on the fence around the perimeter of the site. All perimeter signs were in good condition and showed no evidence of vandalism.

16.4.1.3 Site Markers

Site marker SMK-1, located just inside the southwest gate, and site marker SMK-2, located on top of the disposal cell (PL-7), were both in good condition. Minor cracks in the concrete base of SMK-1 were sealed in May 2003 and have not changed.

16.4.1.4 Survey Monuments and Boundary Monuments

In 2012, all three survey monuments (SM-1, SM-2, and SM-3) were located and in good condition. Although survey monument SM-2 was not observed during the 2011 annual inspection, it was verified in 2012.

Eight boundary monuments were originally installed at the site. Inspection of monument BM-7 was discontinued in 1999 because it is located on the steep embankment below the terrace in an area which cannot be accessed safely. BM-8 was located in 2012. It was intact and will be included in future inspections. BM-1 through BM-6 could not be located during the 2012 annual inspection. In January 2013, a survey team located monuments BM-2 through BM-6, which had been buried by sand. These monuments were unburied, flagged and staked with fence posts to locate them during future inspections. Additionally, the survey crew re-established boundary monument BM-1.

16.4.1.5 Erosion Control Markers

The four pairs of erosion control markers along the edge of the terrace escarpment were in good condition except for the marker near the east entrance gate. This marker was previously damaged by a vehicle (PL-8), but it is still functional and does not require repair at this time.

16.4.1.6 Monitoring Wells

Wells along the terrace and at offsite locations are associated with groundwater restoration and are not included in the annual inspection because the LTSP does not require groundwater monitoring for cell performance. Sampling teams inspect and maintain wells during regularly scheduled water sampling events. All of the wells encountered during the inspection were locked and in good condition.

16.4.2 Inspection Areas

In accordance with the LTSP, the site is divided into three inspection areas (referred to as "transects" in the LTSP) to ensure a thorough and efficient inspection: (1) the disposal cell, including the riprap-covered top and side slopes, diversion channels at the base of the cell, and the outflow channel; (2) the terrace area north and northeast of the disposal cell; and (3) the outlying area.

Within each area, inspectors examined specific site surveillance features, drainage structures, vegetation, and other features. 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.

16.4.2.1 Disposal Cell, Diversion Channels, and Outflow Channel

The riprap-covered top and side slopes of the cell were in good condition. No evidence of settling, slumping, erosion, animal intrusion, riprap deterioration, or other disturbance was found (PL-9). Five open research pits, described in previous annual inspection reports, were present on the cell top (PL-10). These research pits, installed in 2005 were filled in after the 2012 inspection. In 2002, Piezocones installed on the cell cover were removed and the associated pits filled in. Since that time, several of these pits have subsided slightly, forming conical depressions in the cover (PL-11). The surface of the cell was also covered with vehicle ruts (PL-12), many of which were formed in 2008 during herbicide treatment. The condition of the depressions and vehicle ruts is monitored annually and had not changed significantly since the 2011 inspection.

These features will continue to be monitored and photographed to document any changes. Inspectors noted the location and species of plants in accordance with the LTSP.

Diversion channels around the base of the disposal cell were in good condition and contained little vegetation. Small quantities of non-woody plants were growing in the outflow channel, and woody vegetation was growing on the banks of the channel; neither was expected to obstruct flow. However, tumbleweeds and trash have accumulated along the perimeter fence where it crosses the outflow channel and could potentially obstruct flow (Section 16.4.1.2).

16.4.2.2 Terrace Area

The terrace area is located north and northeast of the disposal cell along the top of a steep escarpment. Very little vegetation grows on the terrace (PL-13). The escarpment, approximately 300 feet from the eastern edge of the disposal cell, is prone to slumping. Fractures and incipient slumps can occur in the Mancos Shale bedrock along the escarpment northwest of erosion control marker 1A. No new erosion was evident in 2012 (PL-14).

16.4.2.3 Outlying Area

A NECA gravel pit is located immediately southeast of the disposal cell. No significant changes in land use associated with the gravel pit or with other outlying areas near the disposal cell were identified. Inspectors will continue to monitor sand and gravel operations to ensure that gravel pit activities do not encroach on or adversely impact the disposal site and perimeter fence.

The offsite portion of the outflow channel was functional and in good condition (PL-15).

16.5 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.

16.6 Maintenance and Repair

The following maintenance items, identified during the 2012 inspection, have been addressed:

1. Remove sediment and debris from under the southwest entrance gate.
2. Remove accumulated tumbleweed and trash from along the disposal site's perimeter fence, the outflow channel, and the fence surrounding the evaporation pond.
- 16A 3. Cover five research pits in the disposal cell cover installed in 2005.
- 16B 4. Reestablish boundary monument BM-1, unbury boundary monuments BM-2 through BM-6, and install reference posts at all boundary monument locations.

The following items will be addressed before the 2013 inspection:

- 16C 1. Replace the pictorial sign missing from the northwest entrance gate.

16.7 Environmental Monitoring

16.7.1 Groundwater Monitoring

In accordance with the LTSP, cell performance monitoring of groundwater is not required at the site. Onsite wells are associated with separate groundwater restoration activities and are not included in the annual inspection.

16.8 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.

16.9 Photographs

Photograph Location Number	Azimuth	Description
PL-1	310	New entrance sign at east gate.
PL-2	275	Sediment buildup along southwest gate.
PL-3	180	Trash and tumbleweed buildup in fence corner by perimeter sign P14.
PL-4	325	Tumbleweed buildup near the east gate.
PL-5	360	Bent fence (still intact) from large culvert in NECA yard near perimeter sign P13.
PL-6	180	Placing rocks in hole under perimeter fence.
PL-7	5	Site marker SMK-2.
PL-8	300	Erosion control marker damaged but functional.
PL-9	75	Side slope of disposal cell, view east.
PL-10	280	Open test pit on western portion of cell.
PL-11	300	Historical test pit on eastern edge of cell.
PL-12	130	Vehicle tracks visible on disposal cell cover, southwest portion of cell.
PL-13	110	View of terrace from the northern phytoremediation test plot.
PL-14	25	Repaired section of escarpment, view from near survey monument SM-1.
PL-15	30	Erosion control fabric along outflow channel.

*The azimuth is not given because the photo was taken at close range.



SHP 5/2012. PL-1. New entrance sign at east gate.



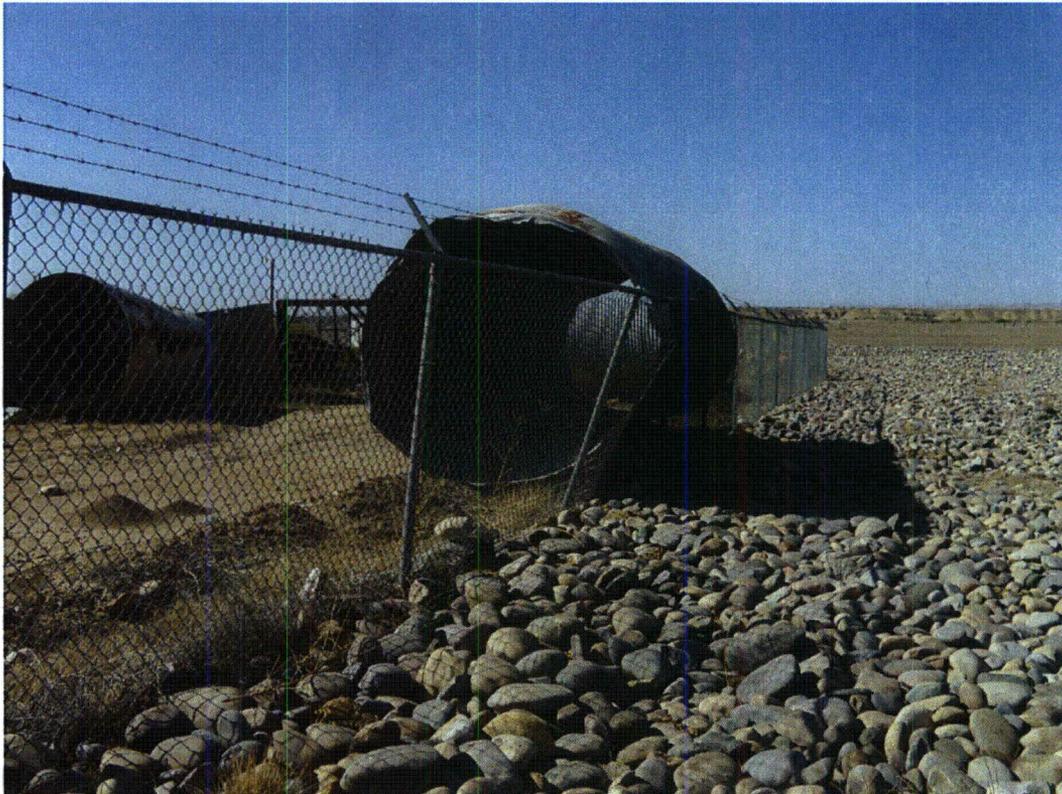
SHP 5/2011. PL-2. Sediment buildup along southwest gate.



SHP 5/2012. PL-3. Trash and tumbleweed buildup in fence corner by perimeter sign P14.



SHP 5/2012. PL-4. Tumbleweed buildup near the east gate.



SHP 5/2012. PL-5. Bent fence (still intact) from large culvert in NECA yard near perimeter sign P13.



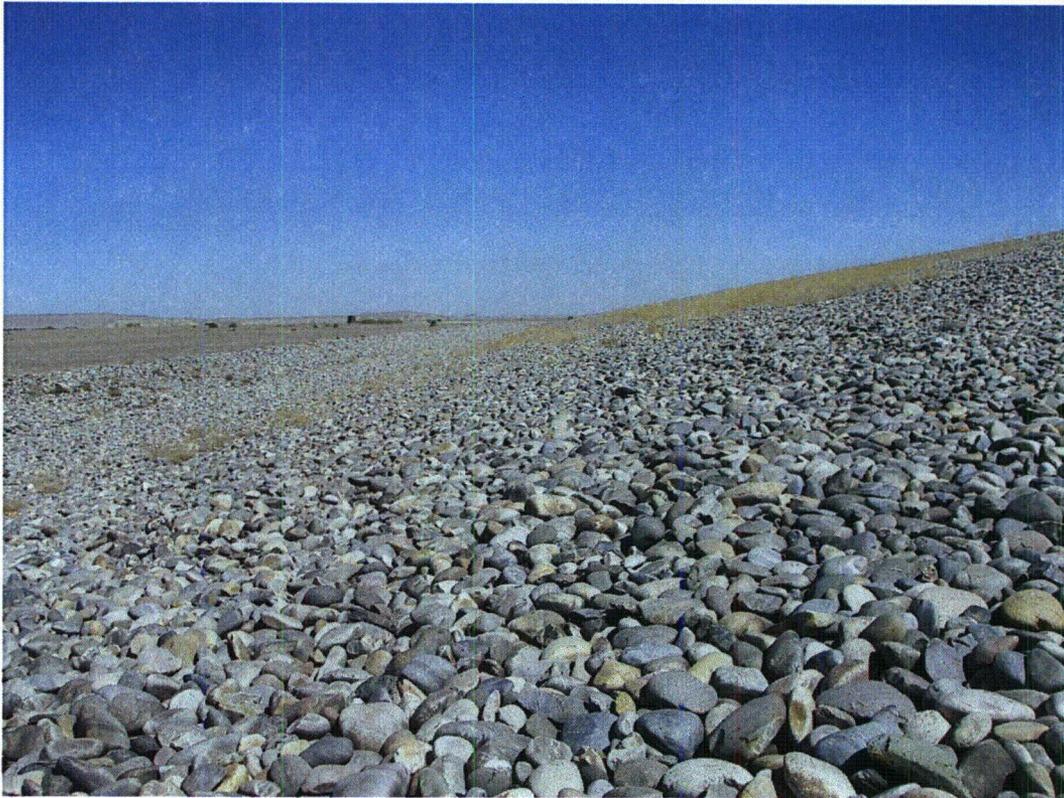
SHP 5/2012. PL-6. Placing rocks in hole under perimeter fence.



SHP 5/2012. PL-7. Site marker SMK-2.



SHP 5/2012. PL-8. Erosion control marker damaged but functional.



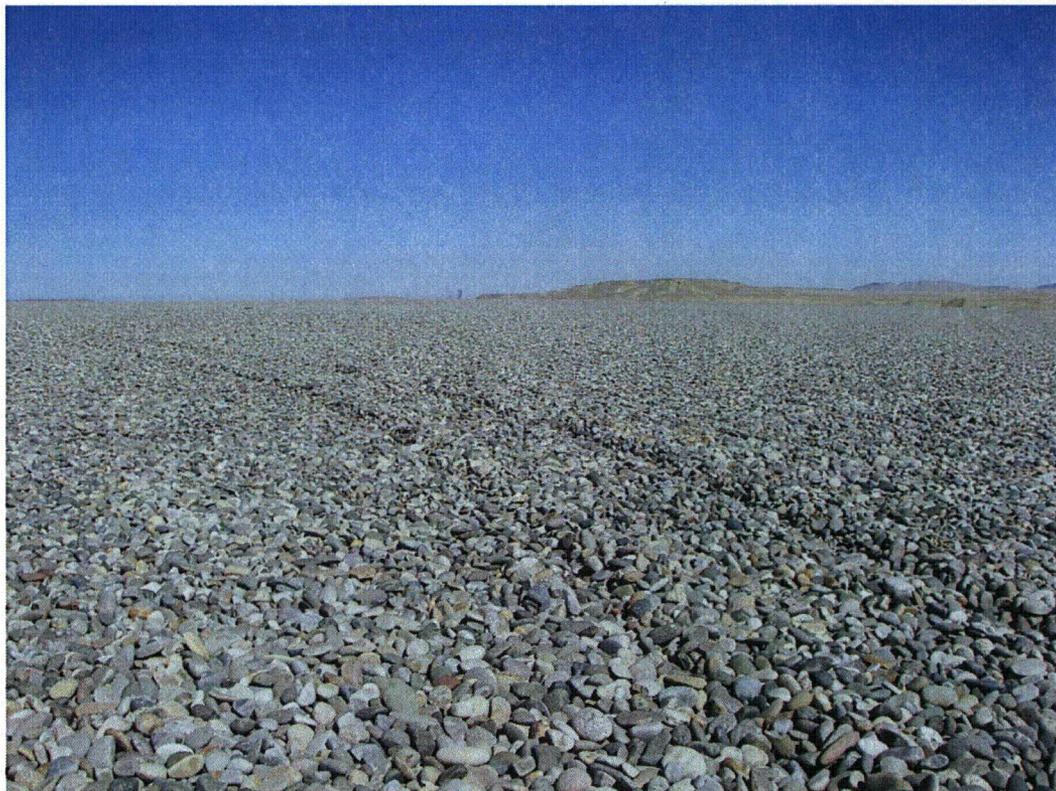
SHP 5/2012. PL-9. Side slope of disposal cell, view east.



SHP 5/2012. PL-10. Open test pit on western portion of cell.



SHP 5/2012. PL-11. Historical test pit on eastern edge of cell.



SHP 5/2012. PL-12. Vehicle tracks visible on disposal cell cover, southwest portion of cell.



SHP 5/2012. PL-13. View of terrace from the northern phytoremediation test plot.



SHP 5/2012. PL-14. Section of escarpment near survey monument SM-1.



SHP 5/2012. PL-15. Erosion control fabric along outflow channel.

17.0 Annual Inspection of the Slick Rock, Colorado, UMTRCA Title I Disposal Site

17.1 Compliance Summary

The Slick Rock, Colorado, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site was inspected on May 15, 2012, and was in good condition. The rock-covered top and side slopes of the disposal cell are in excellent condition. The site access road, entrance gate, fence, and site markers were in good to excellent condition; however, survey monument 2, northwest of the disposal cell, could not be located. During the 2011 inspection, most of the boundary monuments and survey monuments were not inspected due to inclement weather. There is a possibility the monument was missing before last year's inspection. The site was revisited with a GPS unit in July to determine the location of the missing monument. There are several minor erosional features on the site that have not increased in size since the last inspection, and there are active rills in areas west and south of the cell that continue to develop. Preexisting rills and gullies were inspected near perimeter signs P2, P3, and P5. Other rills occur southeast of the disposal cell and north of the retention pond. However, due to their locations, none of these erosional features pose a hazard to the disposal cell or are cause for concern. They will continue to be monitored. No maintenance needs or cause for a follow-up or contingency inspection was identified.

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

17.2 Inspection Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the *Long-Term Surveillance Plan for the Burro Canyon Disposal Cell, Slick Rock, Colorado* (DOE/AL/62350-236, Rev. 0, U.S. Department of Energy [DOE], May 1998; 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 17-1 lists these requirements.

Table 17-1. License Requirements for the Slick Rock Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Sections 3.0 and 6.2	Section 17.4
Follow-Up or Contingency Inspections	Section 3.4	Section 17.5
Routine Maintenance and Repairs	Section 4.0	Section 17.6
Groundwater Monitoring	Sections 2.5 and 2.6	Section 17.7.1
Corrective Action	Section 5.0	Section 17.8

17.3 Institutional Controls

The 62-acre site is owned by the United States of America and was accepted under the U.S. Nuclear Regulatory Commission general license (10 CFR 40.27) in 1998. 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 a locked gate at the site entrance.

17.4 Inspection Results

The site, northeast of Slick Rock, Colorado, was inspected on May 15, 2012. D. Traub and L. Sheader of the S.M. Stoller Corporation, the Legacy Management Support contractor at the DOE office in Grand Junction, Colorado, performed the inspection. J. Nguyen, the DOE Office of Legacy Management site manager, and M. Cosby of the Colorado Department of Public Health and Environment accompanied the inspectors.

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.

17.4.1 Site Surveillance Features

The locations of site surveillance features are shown on Figure 17-1. 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 on the Figure 17-1 by photograph location (PL) numbers.

17.4.1.1 Entrance Gates, Entrance Signs, and Access Road

Site access is by an improved gravel and dirt road maintained by San Miguel County. The road is in good condition. Soil erosion under the fence along the county road continues to be monitored (PL-1).

The entrance to the site is through a barbed-wire gate that is secured with a DOE lock. The gate is in good condition.

17.4.1.2 Perimeter Fence and Perimeter Signs

The stock fence around the site is strung with four strands of wire with spacers. The top and bottom strands are smooth wire to allow wildlife to pass over and under, and the middle two strands are barbed wire. The stock fence is in good condition. There are several places around the perimeter where the top strand of the fence has been slightly stretched down by deer or elk.

Thirty-two perimeter signs, designated P1 through P32, are spaced at approximately 200-foot intervals around the site (PL-2). The signs, attached to steel posts set in concrete, are 5 feet inside the site boundary. Perimeter sign P30 was missing in July 2011 and was replaced in October 2011 using theft-resistant fasteners. All other signs are in good condition.

17.4.1.3 Site Markers

The two granite site markers, SMK-1 near the entrance gate and SMK-2 (PL-3) on the north-central part of the disposal cell, are in excellent condition. Erosion near SMK-1 is being monitored and may require remedial work if heavy rainfalls occur and erosion of the surrounding soil continues.

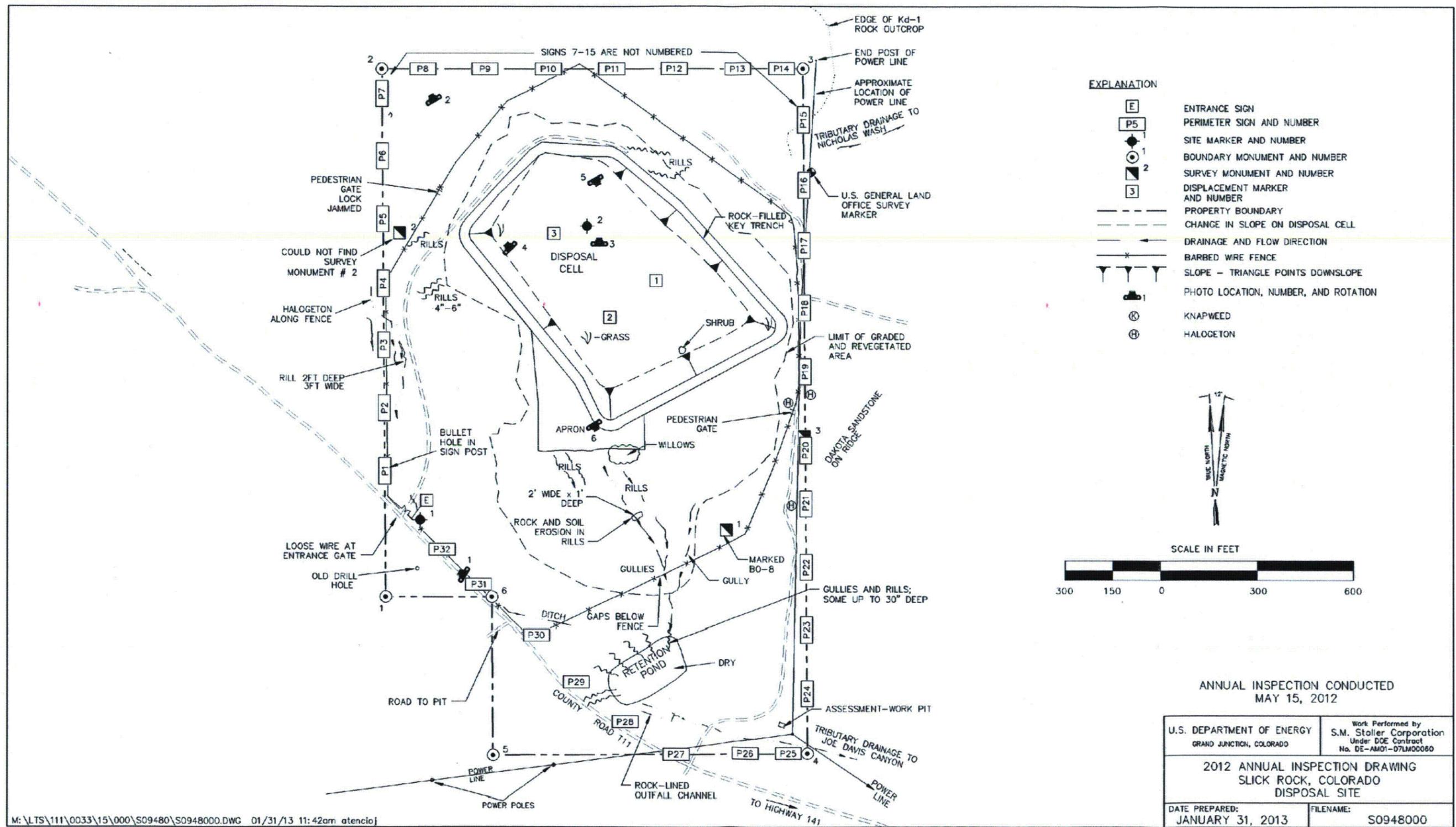


Figure 17-1. 2012 Annual Compliance Drawing for the Slick Rock Disposal Site

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17.4.1.4 Survey Monuments and Boundary Monuments

Six boundary monuments define the corners of the site boundary. Survey monument 2 could not be located despite a rigorous search. No ground disturbances or tire tracks were observed nearby. The locations of all boundary and survey monuments will be loaded into a GPS unit, which will be used to verify the location of the monuments. The remaining boundary and survey monuments were in excellent condition.

17.4.2 Inspection Areas

In accordance with the LTSP, the site is divided into three inspection areas (referred to as "transects" in the LTSP) to ensure a thorough and efficient inspection: (1) the rock-covered top of the disposal cell, including side slopes, the key trench, and the apron; (2) the area between the disposal cell and the site boundary, including the retention pond and the stock fence; and (3) the outlying area.

Within each area, the inspectors examined specific site surveillance features, drainage structures, vegetation, and other features. 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.

17.4.2.1 Disposal Cell, Diversion Channels, and Outflow Channel

Rock covering the disposal cell, key trench, and apron is rounded cobble- and pebble-sized material. The rock is in excellent condition (PL-4 and PL-5). No evidence of settling, slumping, or erosion was seen on any of the rock-covered surfaces of the disposal cell. No phreatophytes or other deep-rooted plant species were observed on the surface of the cell.

The top of the disposal cell is roughly pentagonal. Five side slopes descend from the disposal cell top at a maximum grade of 25 percent and are covered with riprap. At the base of the side slopes is a key trench that encircles the disposal cell. The key trench is as much as 5 feet deep and 20 feet wide and filled with riprap. South and downslope of the disposal cell, an apron of riprap extends for 50 to 200 feet beyond the key trench (PL-6). All side slopes, the key trench, and the apron are in excellent condition.

17.4.2.2 Area Between the Disposal Cell and the Site Property Boundary

The area around the disposal cell includes the retention pond. Surface drainage from the disposal cell flows south into the retention pond, which is constructed in a channel tributary to Joe Davis Canyon. An outflow channel below the pond is lined with rounded cobblestones for a short distance. The pond, which was dry at the time of the inspection, and outflow channel are in good condition. Some of the gullies on the northwest side of the retention pond are as deep as 30 inches, but they do not present a hazard to the disposal cell or to any site features, so action is not warranted at this time. These erosional features will continue to be monitored during future inspections.

As noted during previous inspections, rills have formed downslope of the disposal cell apron, between the apron and retention pond. Some of these rill features contained evidence of recent runoff events, such as sedimentation and soil loss; however, they do not present a hazard to the

disposal cell. These features will be monitored during future inspections to determine if additional actions are warranted.

Inspectors have also monitored the size of rills east of perimeter signs P2 and P3 over the last several years. In 2008 the largest rill was noted to be approximately 2 feet wide by 2 feet deep, twice as deep as what was noted in 2007. No increase in size was noted during this inspection. This rill does not appear to have increased in size appreciably over the last year.

17.4.2.3 Outlying Area

The natural, undisturbed areas outside the disposal site support grass and scattered piñon and juniper trees. The primary land use is grazing. Steep hillsides north and northeast of the site slope eastward into Nicholas Wash. Areas north and northeast of the site also are routinely used for recreational purposes (e.g., hunting, four-wheeling, firewood cutting). No disturbances or evidence of land use changes in the outlying areas were noted. During the 2012 inspection, several mining claim stakes were noted adjacent to the boundary on the northwest corner of the site.

17.5 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.

17.6 Maintenance and Repairs

- 17A Survey monument 2 could not be located during the 2012 inspection. A GPS unit was programmed with the survey monument location and the monument was located on July 30th. The monument had been buried under approximately 4 inches of soil.

No additional maintenance needs were identified during the inspection.

17.7 Environmental Monitoring

17.7.1 Groundwater Monitoring

There are no monitoring wells at the site, and no groundwater monitoring is required.

17.8 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.

17.9 Photographs

Photo Location Number	Azimuth	Description
PL-1	315	PL-1. View toward northwest along county road; fence line erosion.
PL-2	330	PL-2. Typical perimeter sign along west boundary of site.
PL-3	NA	PL-3. Site marker 2 on top of disposal cell.
PL-4	315	PL-4. Southeast face of cell, across apron.
PL-5	150	PL-5. Top of cell from northwest to southeast.
PL-6	150	PL-6. Willows growing at base of apron.



SRK 5/2012. PL-1. View toward northwest along county road; fence line erosion.



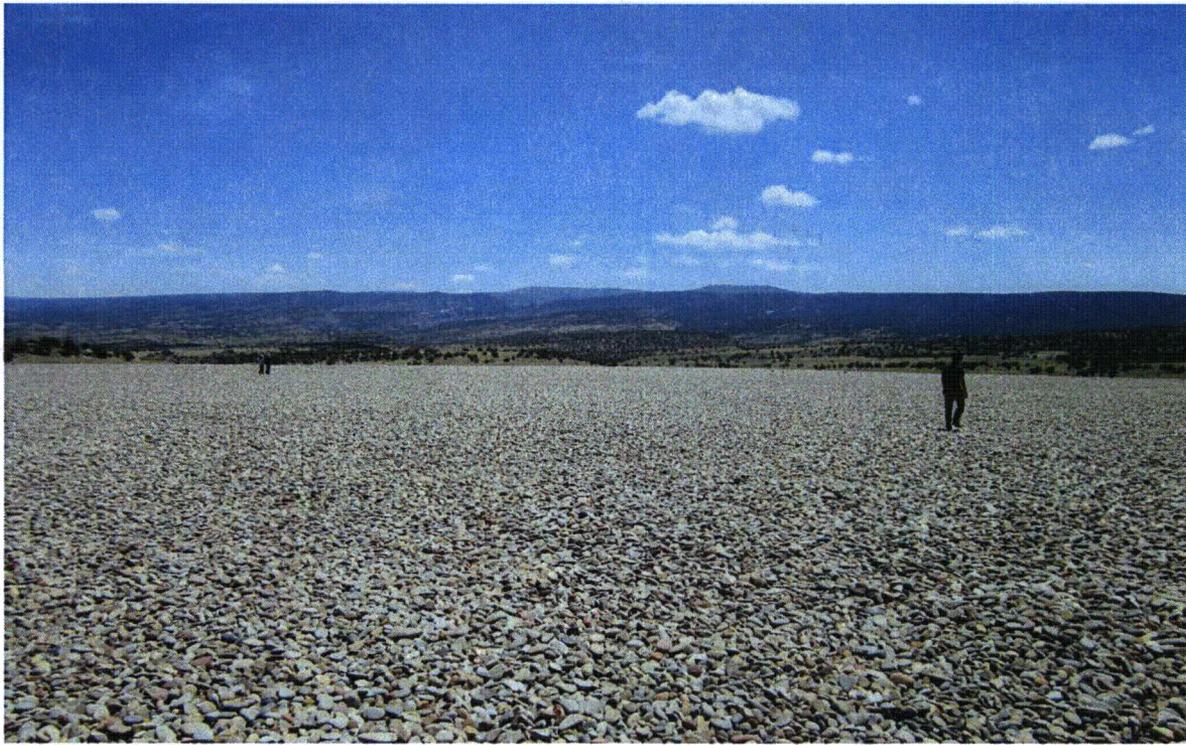
SRK 5/2012. PL-2. Typical perimeter sign along west boundary of site.



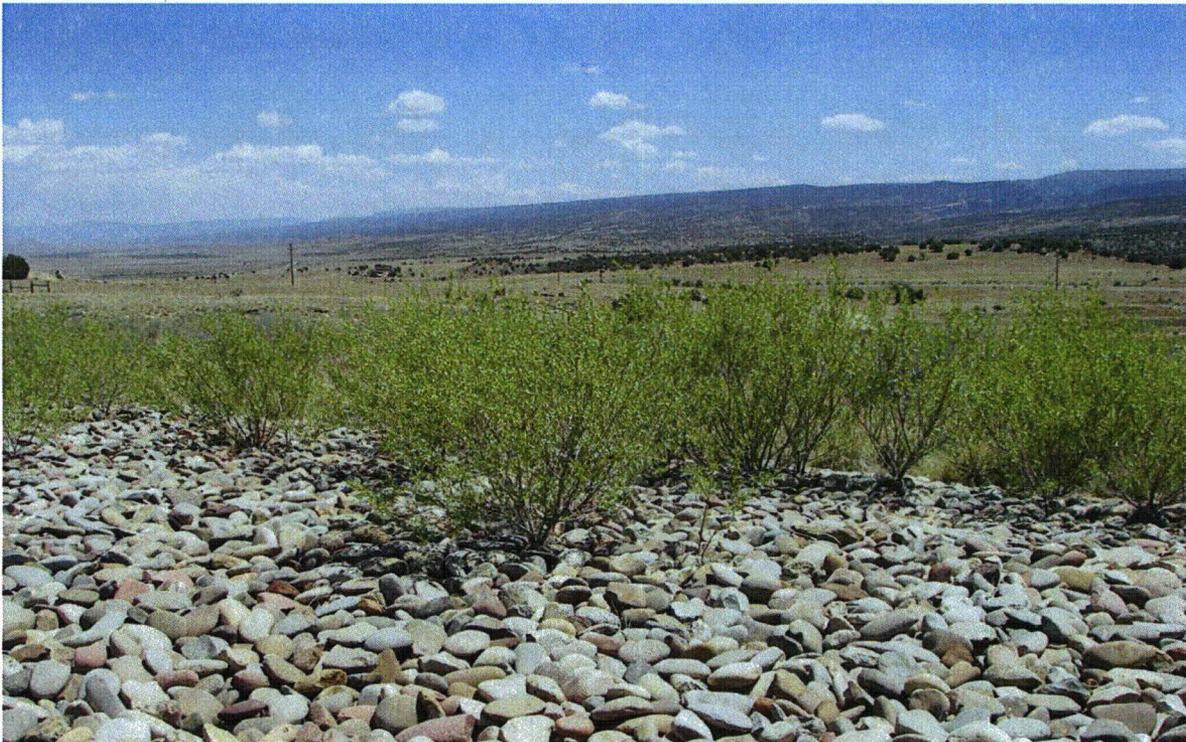
SRK 5/2012. PL-3. Site marker 2 on top of disposal cell.



SRK 5/2012. PL-4. Southeast face of cell, across apron.



SRK 5/2012. PL-5. Top of cell from northwest to southeast.



SRK 5/2012. PL-6. Willows growing at base of apron.

18.0 Annual Inspection of the Spook, Wyoming, UMTRCA Title I Disposal Site

18.1 Compliance Summary

The Spook, Wyoming, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site, inspected on June 26, 2012, was in excellent condition. No maintenance needs or cause for a follow-up or contingency inspection was identified.

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

18.2 Inspection Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the *Long-Term Surveillance Plan for the Spook, Wyoming, Disposal Site* (DOE/AL/350215.000, Rev. 0, U.S. Department of Energy [DOE], January 1993; 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 18-1 lists these requirements.

Table 18-1. License Requirements for the Spook Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 6.0	Section 18.4
Follow-Up or Contingency Inspections	Section 7.0	Section 18.5
Routine Maintenance and Repairs	Section 8.0	Section 18.6
Corrective Action	Section 9.0	Section 18.7.1

18.3 Institutional Controls

The 14-acre site is owned by the United States of America and was accepted under the U.S. Nuclear Regulatory Commission general license (10 CFR 40.27) in 1993. 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 disposal site include federal ownership of the property and the following features that are inspected annually: site markers, survey and boundary monuments, and warning/no-trespassing signs.

18.4 Inspection Results

The site, in north-central Converse County, Wyoming, was inspected on June 26, 2012. C. Gauthier and R. Johnson of the S.M. Stoller Corporation, the Legacy Management Support contractor at the DOE office in Grand Junction, Colorado, conducted the inspection. T. Plessinger, the DOE Office of Legacy Management site manager, 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 may affect site integrity, and to determine the need, if any, for maintenance or additional inspections and monitoring.

18.4.1 Site Surveillance Features

The locations of site surveillance features are shown on Figure 18-1. 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 18-1 by photograph location (PL) numbers.

18.4.1.1 Entrance Gates, Entrance Signs, and Access Road

Access to the site, northwest of Douglas, Wyoming, is via Highway 93 to County Road 31 onto the Hornbuckle Ranch road. Site access is maintained through perpetual easements across the Hornbuckle Ranch. The road to the site is graded and hard-packed. The road was in good condition, and the site was accessible. The entrance sign was in good condition.

18.4.1.2 Perimeter Fence and Perimeter Signs

The site is unfenced and defined by 10 perimeter signs. Perimeter sign P10 is damaged from wind. The signs were made in two layers, and the top layer has peeled away from the base. The sign is still legible (PL-1).

18.4.1.3 Site Markers

Site marker SMK-2 was in excellent condition. The concrete base of site marker SMK-1 is damaged due to spalling but is stable; no changes were observed from the previous year (PL-2).

18.4.1.4 Survey Monuments and Boundary Monuments

The eight boundary monuments and three survey monuments are in excellent condition. The locations of the boundary monuments were confirmed by GPS (PL-3).

GPS coordinates confirmed that the boundary monuments and perimeter signs are located outside of the DOE property boundary. The adjacent landowner has been notified that the monuments and signs are on his property. This is not of concern to him, and the monuments and signs will remain where they are.

18.4.1.5 Monitoring Wells

Groundwater monitoring is not required at this site. DOE abandoned all monitoring wells in October 2000 and closed out the permits.

18.4.2 Inspection Areas

In accordance with the LTSP, the site is divided into three inspection areas (referred to as "transects" in the LTSP) to ensure a thorough and efficient inspection: (1) the disposal cell, (2) the site perimeter, and (3) the outlying area.

Within each area, the inspectors examined specific site surveillance features, vegetation, and other features. 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.

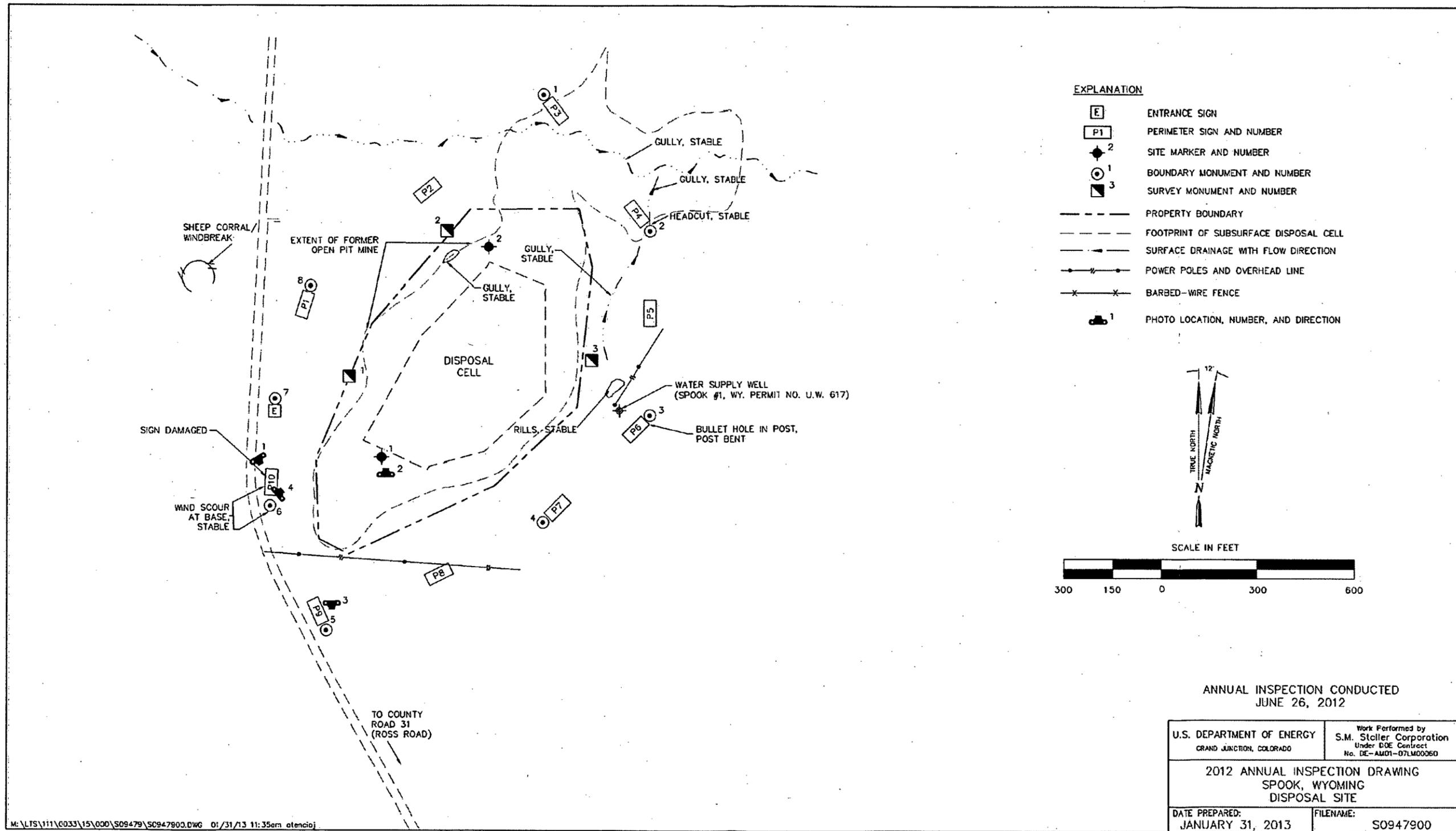


Figure 18-1. 2012 Annual Compliance Drawing for the Spook Disposal Site

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18.4.2.1 Disposal Cell

The site is unique among Title I sites in that tailings were encapsulated in the bottom of an open pit mine and covered with 40 to 60 feet of clean fill and topsoil. As such, many of the observations and concerns routinely associated with above-grade disposal cells—such as the quality of the riprap, the stability of side slopes, or the presence of deep-rooted plants (biointrusion) above the radon barrier—do not apply to this site. The surface of the 5-acre disposal cell, completed in 1989, was in excellent condition. No evidence of settling was observed over the former mine pit. Vegetation across the cell, consisting of grasses and forbs, appears healthy and is indistinguishable from that which grows on the surrounding hills and valleys. The same species are present, and the overall health and density of vegetation are similar (PL-4).

18.4.2.2 Site Perimeter

This area was in excellent condition. The perimeter of the site is indistinguishable from the adjacent open range.

18.4.2.3 Outlying Area

The area beyond the site boundary for a distance of about 0.25 mile was examined for erosion, disturbance, change in land use, or other features of possible concern. The access road experiences frequent truck traffic to service and maintain the oil wells in the area. Even though oil field activity has greatly increased near the site, no evidence of trespassing or vandalism was observed.

Several minor rills and gullies are near the site. They appeared to be stable during the inspection. The erosion is not harming the function of the cell cover or other site features, and it is not a concern at this time.

18.5 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.

18.6 Maintenance and Repairs

No maintenance needs were identified during the inspection.

18.7 Environmental Monitoring

18.7.1 Groundwater Monitoring

Groundwater in the uppermost aquifer at this site is contaminated as a result of widespread, naturally occurring uranium mineralization. The aquifer is of limited use because its yield is

marginal and because it cannot be cleaned up by methods reasonably employed in public water systems. Therefore, in accordance with 40 CFR 192.21 (g), narrative supplemental standards have been applied to the site, and groundwater monitoring is not required.

18.8 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.

18.9 Photographs

Photograph Location	Azimuth	Description
PL-1	150	Perimeter sign P10 damaged by wind.
PL-2	0	Site marker SMK-1.
PL-3	180	Collecting GPS coordinates at boundary monument BM-5.
PL-4	50	Northeast view across the disposal cell.



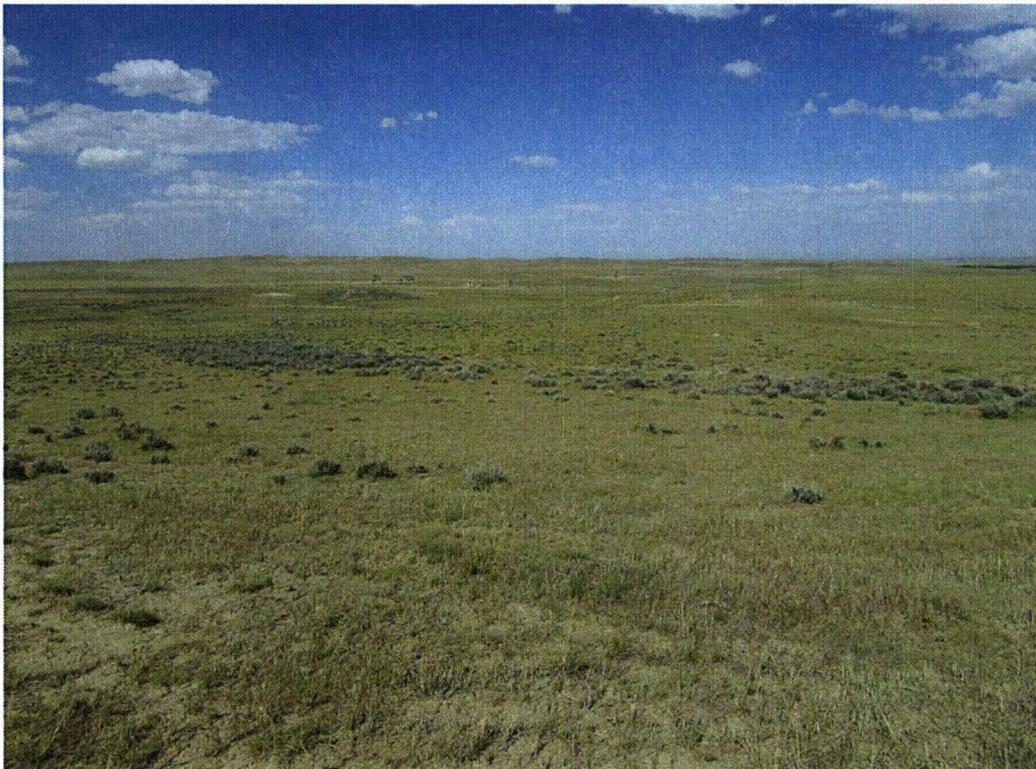
SPK 6/2012. PL-1. Perimeter sign P10 damaged by wind.



SPK 6/2012. PL-2. Site marker SMK-1.



SPK 6/2012. PL-3. Collecting GPS coordinates at boundary monument BM-5.



SPK 6/2012. PL-4. Northeast view across the disposal cell.

19.0 Annual Inspection of the Tuba City, Arizona, UMTRCA Title I Disposal Site

19.1 Compliance Summary

The Tuba City, Arizona, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site was inspected on April 4, 2012. The disposal cell and all associated surface water diversion and drainage structures were in excellent condition and functioning as designed. No maintenance needs or cause for a follow-up or contingency inspection was identified.

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

19.2 Inspection Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the *Long-Term Surveillance Plan for the Tuba City, Arizona, Disposal Site* (DOE/AL/62350-182, Rev. 0, U.S. Department of Energy [DOE], October 1996; 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 19-1 lists these requirements.

Table 19-1. License Requirements for the Tuba City Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 6.0	Section 19.4
Follow-Up or Contingency Inspections	Section 7.0	Section 19.5
Routine Maintenance and Repairs	Section 8.0	Section 19.6
Groundwater Monitoring	Section 5.2	Section 19.7.1
Corrective Action	Section 9.0	Section 19.8

19.3 Institutional Controls

The U.S. Bureau of Indian Affairs holds the 145-acre disposal site in trust. The Navajo Nation retains title to the land. 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. The U.S. Nuclear Regulatory Commission (NRC) required DOE to enter into Cooperative Agreement DE-FC04-85AL26731 with the Navajo Nation to perform remedial actions at the former processing sites before bringing the site under the general license. DOE and the Navajo Nation executed a Custodial Access Agreement that conveys to the federal government title to the residual radioactive materials stabilized at the repository site and ensures that DOE has perpetual access to the site.

The site was accepted under NRC general license (10 CFR 40.27) in 1996 for compliance with 40 CFR 192, Subpart A. 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.

19.4 Inspection Results

The site, located east of Tuba City, Arizona, was inspected on April 4, 2012. R. Johnson and J. Gillespie of the S.M. Stoller Corporation, the Legacy Management Support contractor at the DOE office in Grand Junction, Colorado, conducted the inspection. R. Bush, the DOE Office of Legacy Management site manager; L. Benally of the Navajo Abandoned Mine Lands/Uranium Mill Tailings Remedial Action Department; N. Honie of the Hopi Nation; and NRC representatives B. Spitzberg, L. Gersey, and R. Evans 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 may affect site integrity, and to determine the need, if any, for maintenance or additional inspections and monitoring.

19.4.1 Site Surveillance Features

The locations of site surveillance features are shown in Figure 19-1. 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 on the attached drawing by photograph location (PL) numbers.

Many structures and features at the site—including an office building, a water treatment plant, a solar water-heating system, a solar photovoltaic system, evaporation ponds, an extensive network of extraction and monitoring wells, and a treated water infiltration system—are associated with the active treatment of contaminated groundwater, which is ongoing. The purpose of the active groundwater remediation is to mitigate contamination resulting from former uranium processing that occurred at the site. These activities are not addressed in the LTSP, however, because they are not related to the long-term disposal and stabilization of encapsulated contaminated materials. As such, associated features are not included in the annual inspection and are only addressed herein as they relate to site integrity or safety concerns.

19.4.1.1 Entrance Gates, Entrance Signs, and Access Road

The site is accessed directly from U.S. Highway 160. Perpetual access to the site is granted by the Custodial Access Agreement. A gate in a fence on the highway right-of-way allows access to the site along a gravel access road; the site entrance gate is at the perimeter security fence. The access gate, road, and entrance gate to the site were in good condition. The gates were open at the time of the inspection because of ongoing groundwater remediation operations at the site (PL-1). The entrance signs posted on both gates were in good condition.

19.4.1.2 Perimeter Fence and Perimeter Signs

The security fence around the site perimeter was in good condition (PL-2).

Perimeter signs are posted in pairs at regular intervals around the site perimeter. Each sign pair, secured to a metal post, consists of a “No Trespassing” sign with a radioactive materials trefoil symbol and a schematic sign with a diagram of the disposal cell (also identified by the radioactive materials trefoil symbol) and the site boundary (PL-3). All of the signs were in good condition.

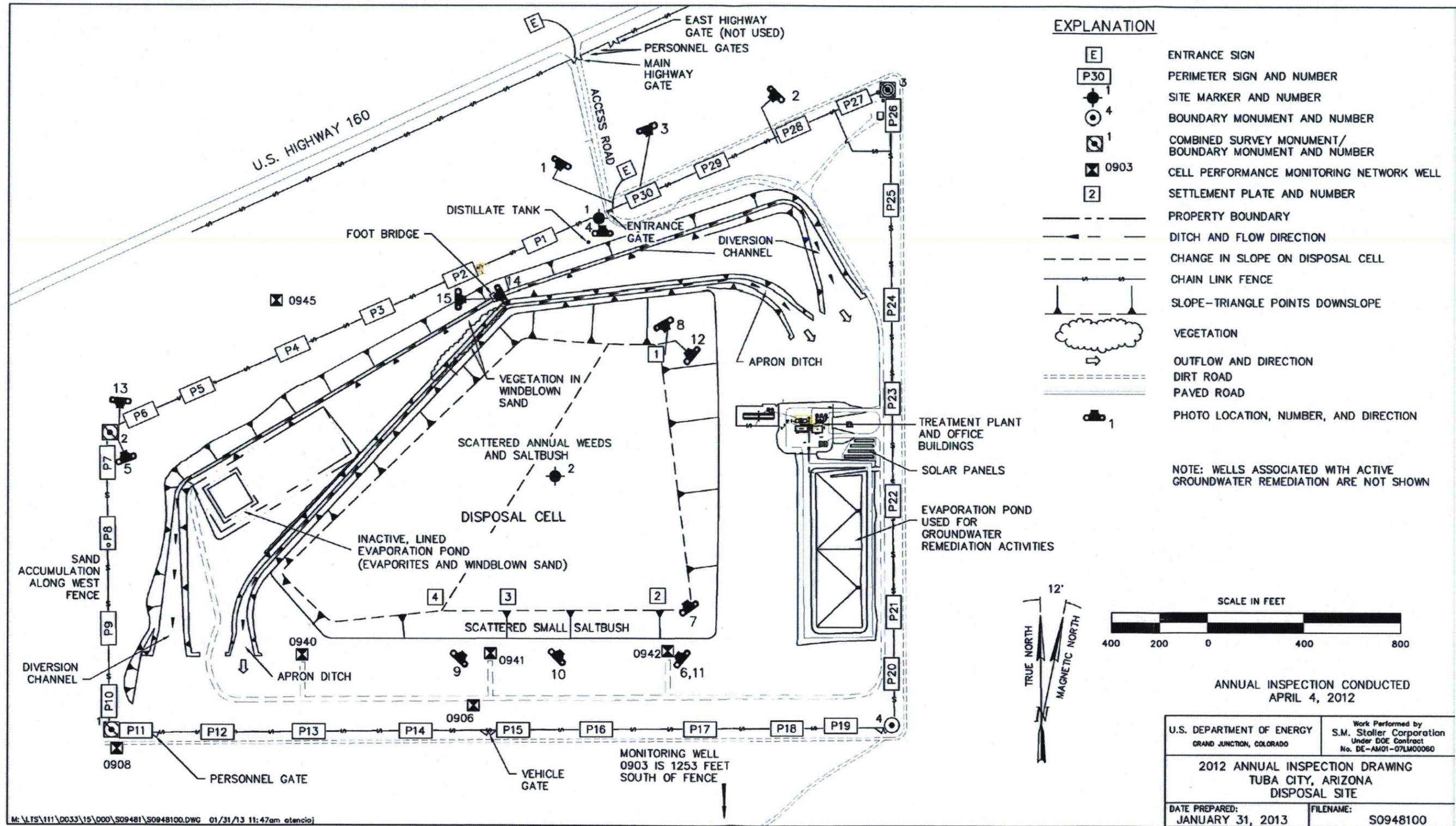


Figure 19-1. 2012 Annual Compliance Drawing for the Tuba City Disposal Site

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19.4.1.3 Site Markers

The two granite site markers, one just inside and to the right of the entrance gate (PL-4) and the other on top of the disposal cell, were in good condition.

19.4.1.4 Survey Monuments and Boundary Monuments

The survey and boundary monuments that were observed were in good condition (PL-5). Boundary monument BM-3, at the northeast corner of the site, was buried by windblown sand.

19.4.1.5 Monitoring Wells

Seven wells constitute the cell performance monitoring network: 0903, 0906, 0908, 0940, 0941, 0942, and 0945. Five wells inside and immediately adjacent to the site were in good condition and locked. The vault cover for well 0942 was open for well maintenance at the time of the inspection (PL-6). Monitoring well 0903, located about 0.25 mile south of the disposal cell, was not inspected.

19.4.2 Inspection Areas

In accordance with the LTSP, the site is divided into three inspection areas (referred to as "transects" in the LTSP) to ensure a thorough and efficient inspection: (1) the disposal cell, (2) the area between the disposal cell and the site boundary, and (3) the outlying area.

Within each area, the inspectors examined specific site surveillance features, drainage structures, vegetation, and other features. 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.

19.4.2.1 Disposal Cell

The disposal cell is covered with riprap to control erosion. The rock cover material was in excellent condition and showed no signs of deterioration. No evidence of differential settlement or slumping was observed, and all visible components of the disposal cell and cover were in excellent condition (PL-7 and PL-8).

In accordance with the LTSP, deep-rooted vegetation, primarily saltbush, is removed or controlled to prevent potential penetration of the radon barrier. Periodic application of herbicide has been very effective in controlling deep-rooted vegetation growth on the cell cover. Only a few small shrubs were noted during the 2012 inspection. Scattered patches of grass and annual weeds also grow on the cell top and side slopes; however, these shallow-rooted plants are not a concern. Windblown sand continues to accumulate on the rock-covered surfaces, providing a favorable environment for plant growth.

Sand accretion and vegetation encroachment are still evident at several locations along the south side slope of the disposal cell. Photographs are taken at these locations annually to document changes in sand accretion and vegetation conditions (PL-9, PL-10, and PL-11). The gradually increasing vegetation coverage likely indicates that sand accumulation on the rock-covered slope continues to increase.

19.4.2.2 Area Between the Disposal Cell and the Site Boundary

The apron drainage ditch at the base of the disposal cell and the diversion channel, both located along the north and northwest sides of the cell, were in good condition (PL-12). Windblown sand deposition continues to be monitored at the site because unstable dunes in outlying areas can contribute to sand accumulation along fence lines (PL-13), in diversion channels, and in the rock cover of the disposal cell. Sand accretion and vegetation encroachment have been checked annually since 2001 in the diversion channel and apron drainage ditch on the north and northwest sides of the cell (PL-14 and PL-15). The sand tends to periodically accumulate and scour. The accumulations are not adversely affecting the performance of these features.

Two of the three evaporation ponds located near the northwest side of the disposal cell were removed in 2007, and the area was reclaimed and seeded with a native vegetation seed mix. Although the area is scoured by wind, perennial vegetation continues to establish. The remaining pond is retained as a backup for the main evaporation pond located on the east side of the site.

19.4.2.3 Outlying Area

The area beyond the site boundary for a distance of about 0.25 mile was examined for erosion, disturbance, change in land use, and other features of possible concern. No changes were observed.

19.5 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.

19.6 Maintenance and Repairs

No maintenance needs were identified during the inspection.

19.7 Environmental Monitoring

19.7.1 Groundwater Monitoring

19A In accordance with the LTSP, DOE monitors groundwater to compare current conditions to baseline post-construction (disposal cell) groundwater quality at the site. Groundwater quality beneath and downgradient of the disposal cell has been degraded by contamination from former uranium-processing activities. This preexisting (legacy) processing-site-related groundwater contamination might mask any contamination leaching from the disposal cell. Additionally, transient drainage resulting from the presence of wet tailings and slimes placed within the disposal cell may also occur that would not reflect cell performance. These conditions limit the effectiveness of normal point-of-compliance groundwater monitoring as a reliable indicator of cell performance (40 CFR 192, Subpart A).

Given the preexisting processing-site-related contamination described above, long-term groundwater monitoring at point-of-compliance wells in the uppermost aquifer to demonstrate cell performance is not technically feasible at the site. Therefore, groundwater monitoring is performed in accordance with Section 5.2.2 of the LTSP and is defined as *evaluative monitoring*. According to the LTSP, the purpose of this monitoring is to (1) evaluate trends in groundwater quality in the uppermost aquifer, (2) monitor the downgradient extent of contamination in groundwater, and (3) analyze the impacts of transient drainage and surface runoff. Preexisting processing-site-related groundwater contamination at the site is currently under remediation (40 CFR 192, Subpart B).

In accordance with the LTSP, seven compliance wells (Table 19–2) are monitored for four target analytes: molybdenum, nitrate (nitrate plus nitrite as nitrogen), selenium, and uranium. Because of the preexisting groundwater contamination, the LTSP provides provisional upper baseline limits (UBLs) as the main criteria for assessing the results of the evaluative monitoring (Table 19–3). As stated in the LTSP, maximum concentration limits (MCLs) are not appropriate for determining the concentration limits needed to evaluate disposal cell performance. Active groundwater remediation is ongoing at the site. The wells used for the evaluative monitoring of cell performance are a subset of the larger groundwater remediation monitoring well network. The progress of groundwater remediation is evaluated annually.

Table 19–2. Groundwater Monitoring Network at the Tuba City Disposal Site

Monitoring Well	Hydrologic Relationship	Monitoring Frequency
0903	Downgradient (Offsite)	Annually
0906	Downgradient	Semiannually
0908	Downgradient	Semiannually
0940 ^a	Downgradient	Semiannually
0941	Downgradient	Semiannually
0942	Downgradient	Semiannually
0945	Upgradient (Background)	Annually

^a Between August 2004 and February 2010, it was not possible to obtain a sample from well 0940 because of an insufficient volume of water, reflecting the ongoing groundwater remediation pumping being conducted at the site. However, in July 2010 and during both 2011 monitoring events, the volume of water in well 0940 has been sufficient for sampling.

Table 19–3. Provisional Upper Baseline Limits for Groundwater at the Tuba City Disposal Site

Constituent	Provisional UBL (mg/L) ^a	MCL (mg/L)
Molybdenum	0.14	0.10
Nitrate (as Nitrogen)	311 ^b	10 ^c
Selenium	0.05	0.01
Uranium	1.17	0.044

^a As documented in the 1996 LTSP.

^b 311 mg/L (for nitrate as nitrogen) was calculated based on the 1,379 mg/L UBL for nitrate as NO₃.

^c 10 mg/L (for nitrate as nitrogen) was calculated based on the 44 mg/L MCL for nitrate cited in the LTSP. mg/L = milligrams per liter

Evaluative groundwater monitoring in 2012 was conducted in February (for those wells sampled semiannually) and in August (for all wells; see Table 19–2). Figures 19–2 through 19–5 show the time-concentration plots for the four target analytes. The UBLs and MCLs listed in Table 19–3 are also shown.

Sample results from the 2012 evaluative monitoring indicate that groundwater quality immediately downgradient of the former millsite (in onsite wells, 0940, 0941, 0942, 0906, and 0908) is still degraded with respect to concentrations of nitrate, selenium, and uranium in the background well (0945). However, this is not the case for the more distal offsite downgradient well 0903 (approximately 1,250 feet from the site). For all four target analytes, concentrations in this well are still comparable with those detected in the upgradient (background) well 0945, significantly lower than the onsite cell performance wells, and well below corresponding MCLs and UBLs.

As has been the case since 2004, molybdenum concentrations in groundwater were below both the MCL of 0.1 milligram per liter (mg/L) and the UBL of 0.14 mg/L in all wells (Figure 19–2). With respect to background well 0945, molybdenum has been elevated only in wells 0906, 0941, and 0942. Concentrations of molybdenum in wells 0908 and 0940, and in offsite well 0903, have been comparable to background. Molybdenum concentrations in wells 0906 and 0941 were highly variable between 1998 and 2005 (occasionally exceeding the UBL), but they have since stabilized (less than 0.04 mg/L).

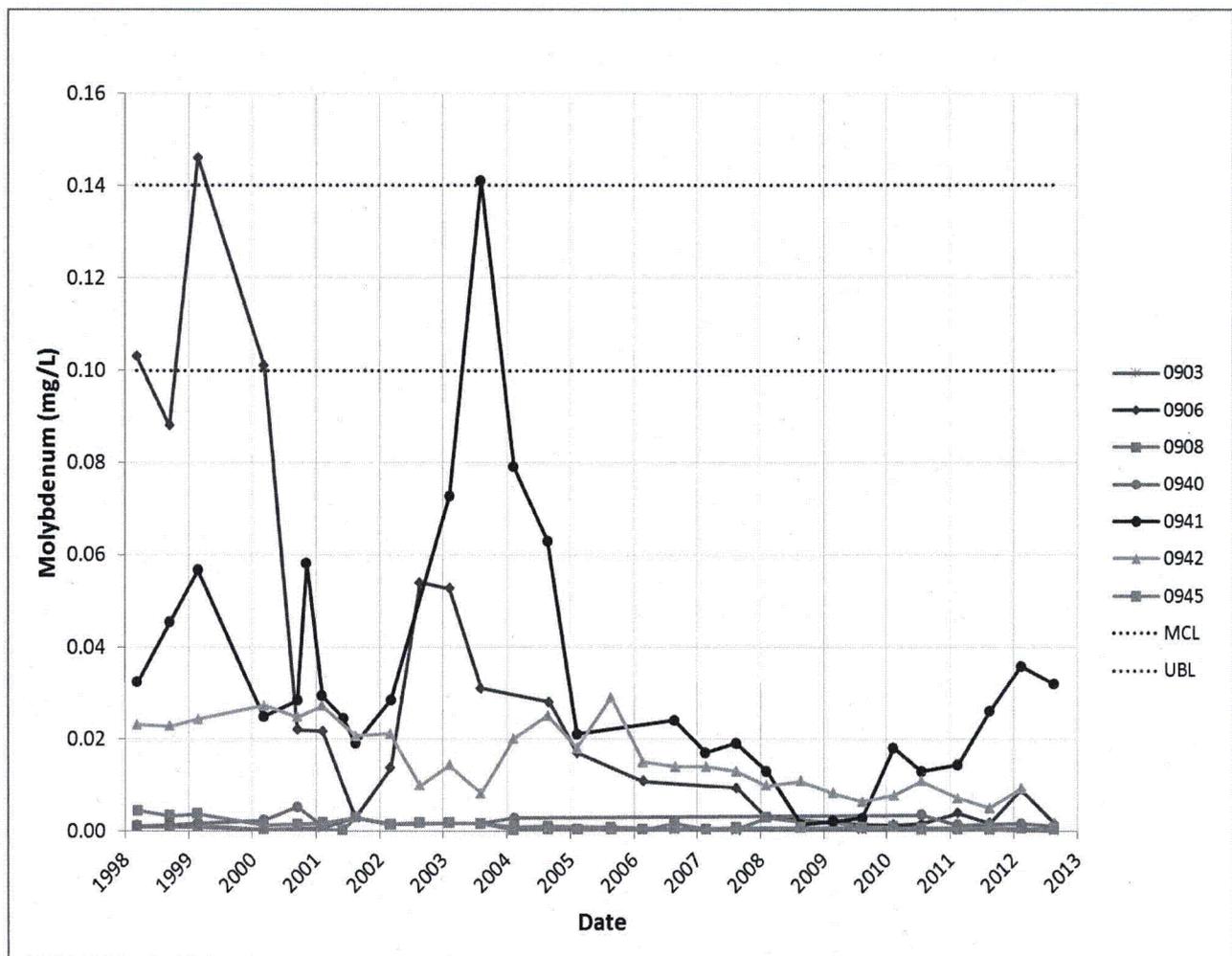


Figure 19–2. Time-Concentration Plots of Molybdenum in Groundwater at the Tuba City Disposal Site

Since 1998, nitrate concentrations in all onsite downgradient wells—0906, 0908, 0941, and 0942—have exceeded the 10 mg/L MCL, most by an order of magnitude or more (Figure 19–3). Nitrate concentrations exceeding the 311 mg/L UBL have only been measured in 0906 (currently 530 mg/L), 0942 (last exceedance in August 2008), and 0940 (currently 420 mg/L). Wells 0908 and 0941 are the only wells that indicate any notable trending (with gradual increases evident since 1998–2000), but nitrate concentrations have stabilized somewhat in the last few years. Nitrate concentrations measured in the offsite downgradient well 0903, although above background and occasionally exceeding the MCL, are still well below the UBL. Concentrations in the upgradient background well 0945 remain below the MCL.

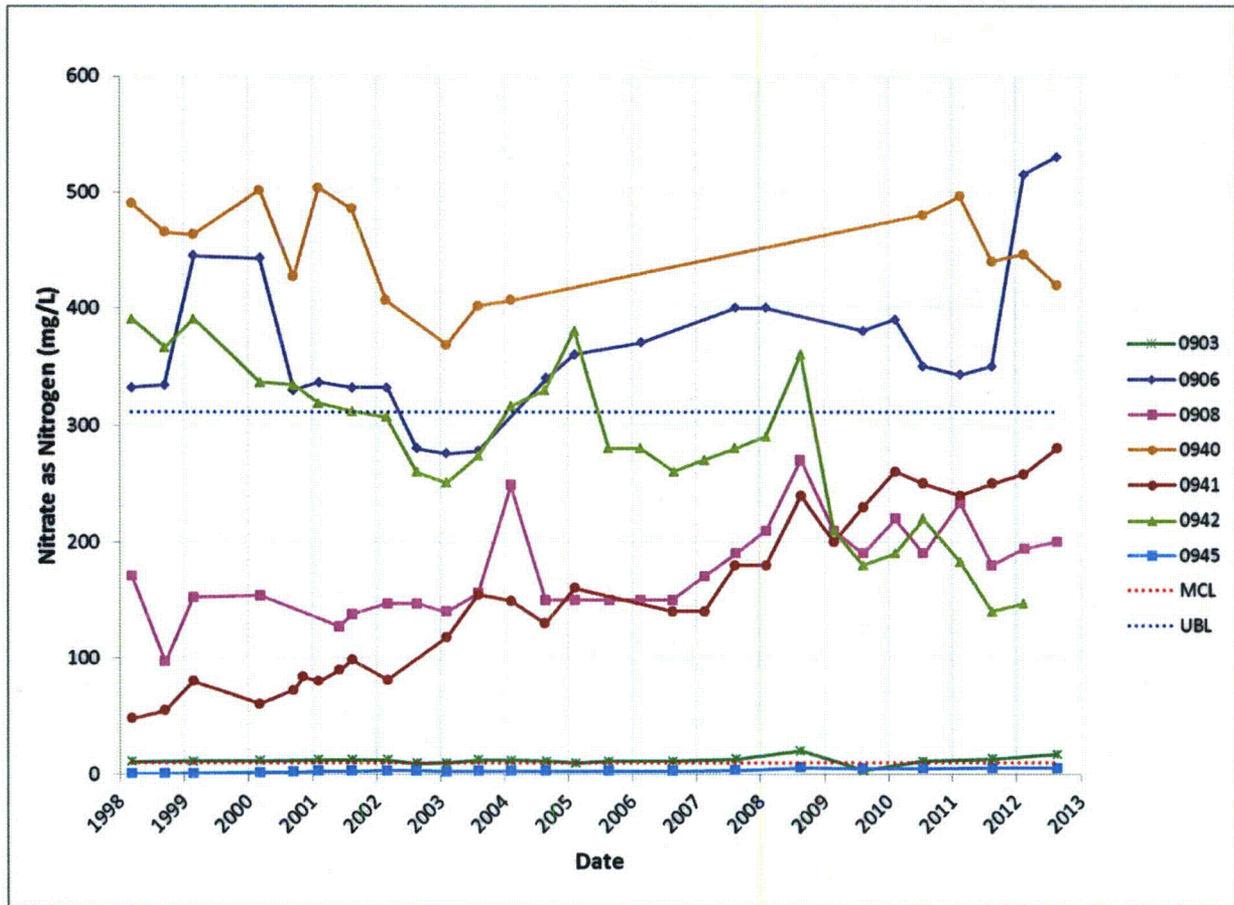


Figure 19–3. Time-Concentration Plots of Nitrate in Groundwater at the Tuba City Disposal Site

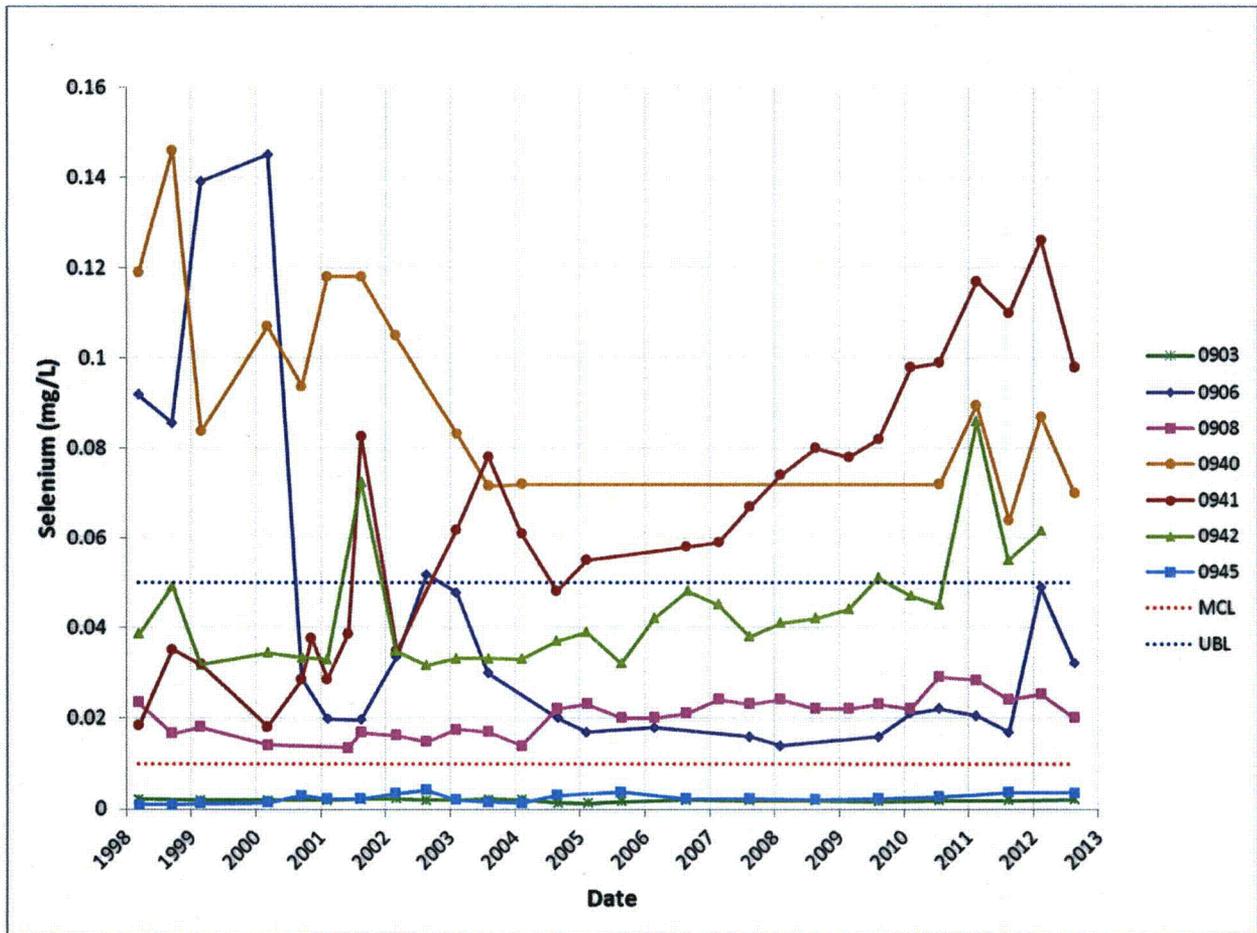


Figure 19-4. Time-Concentration Plots of Selenium in Groundwater at the Tuba City Disposal Site

As shown in Figure 19-4, selenium concentrations measured in groundwater in 2012 exceeded the 0.01 mg/L MCL in all wells except for the offsite downgradient well 0903 and background well 0945. Selenium concentrations exceed the 0.05 mg/L UBL in wells 0940, 0941, and 0942. Selenium concentrations in 0903 have consistently been below both the UBL and the MCL.

In 2012, uranium concentrations in groundwater exceeded the 0.044 mg/L MCL but remained below the 1.17 mg/L UBL in all onsite downgradient wells. This has been the case historically, as shown in Figure 19-5. Concentrations in the upgradient well 0945 and the offsite downgradient well 0903 remain below the MCL. Uranium concentrations in most wells have been quite stable. Exceptions are found in wells 0906 and 0942, where uranium has varied erratically at times.

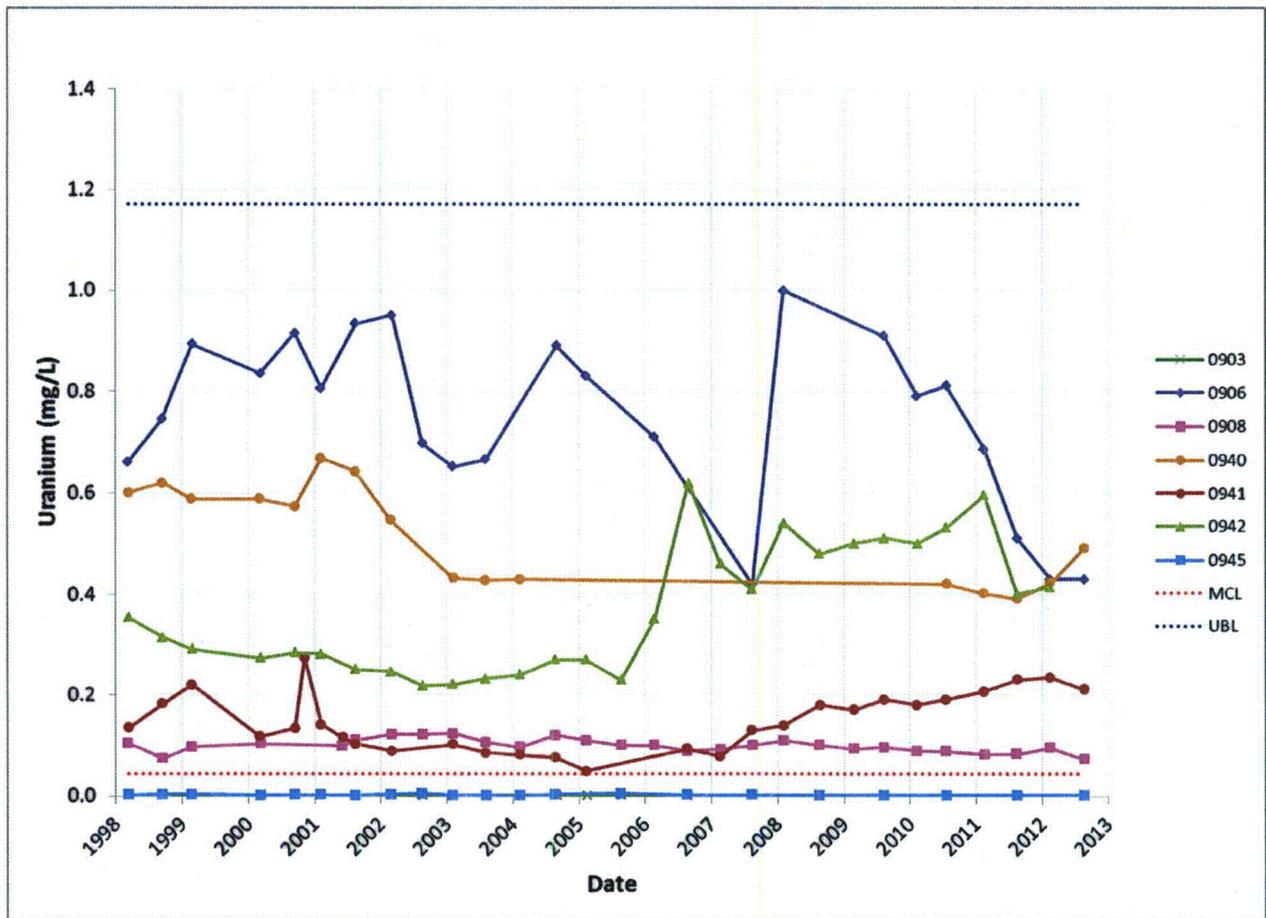


Figure 19-5. Time-Concentration Plots of Uranium in Groundwater at the Tuba City Disposal Site

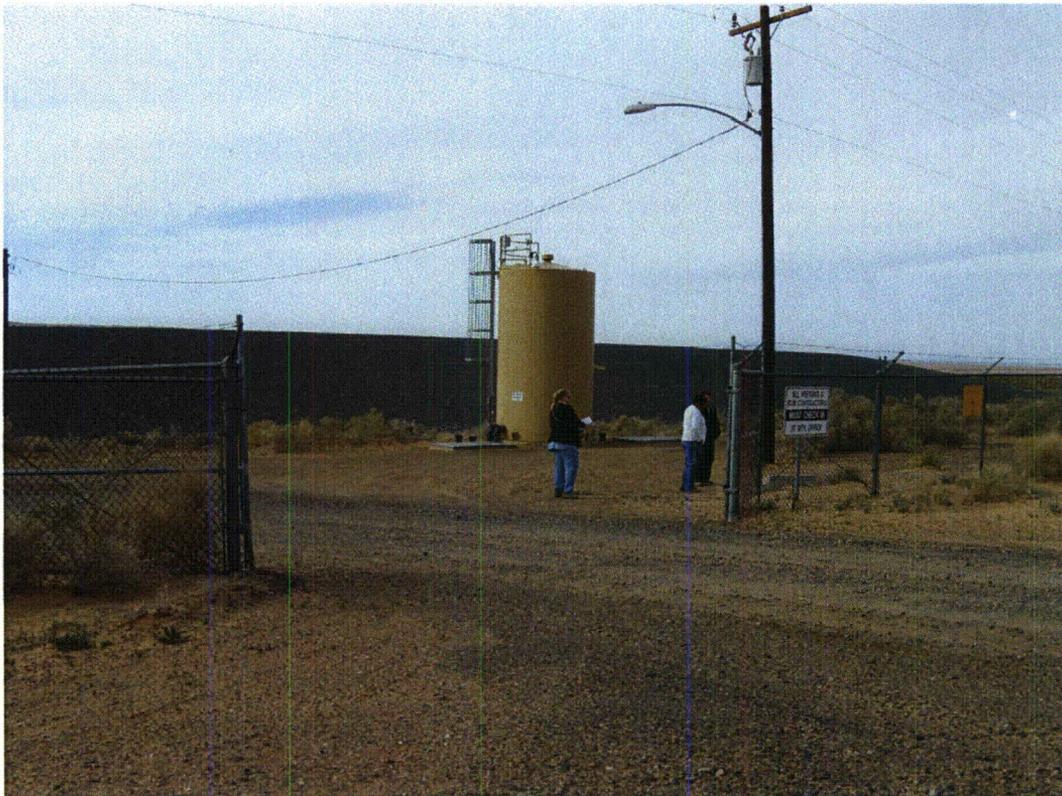
19.8 Corrective Action

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.

19.9 Photographs

Photo Location Number	Azimuth	Photograph Description
PL-1	210	Site entrance gate.
PL-2	255	Northwest security fence line.
PL-3	160	Perimeter sign P30 near the entrance gate.
PL-4	0	Site marker SMK-1 near the entrance gate.
PL-5	340	Boundary monument BM-2.
PL-6	310	Monitoring well 0942 vault open for maintenance.
PL-7	325	View northwest across the disposal cell cover.
PL-8	150	East side slope of the disposal cell and the groundwater treatment plant facilities.
PL-9	45	Vegetation encroachment on the south side slope of the disposal cell. Repeat photograph taken from extraction well 1107.
PL-10	45	Vegetation encroachment on the south side slope of the disposal cell. Repeat photograph taken from extraction well 1105.
PL-11	310	Vegetation encroachment on the south side slope of the disposal cell. Repeat photograph taken from monitoring well 0942.
PL-12	310	North side slope of the disposal cell, apron ditch, and diversion channel.
PL-13	185	Sand accumulation along the west fence line.
PL-14	240	Windblown sand deposition on the south bank of the west diversion channel. Repeat photograph taken from the footbridge.
PL-15	90	East diversion channel and apron ditch viewed from the footbridge.



TUB 4/2012. PL-1. Site entrance gate.



TUB 4/2012. PL-2. Northwest security fence line.



TUB 4/2012. PL-3. Perimeter sign P30 near the entrance gate.



TUB 4/2012. PL-4. Site marker SMK-1 near the entrance gate.



TUB 4/2012. PL-5. Boundary monument BM-2.



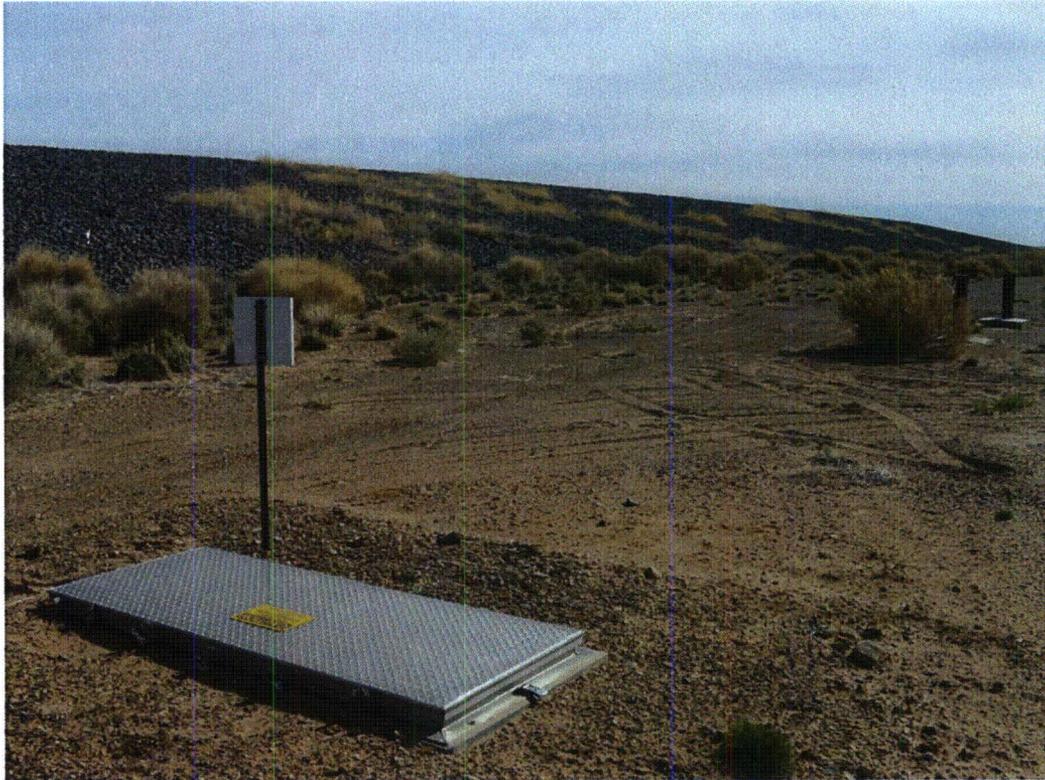
TUB 4/2012. PL-6. Monitoring well 0942 vault open for maintenance.



TUB 4/2012. PL-7. View northwest across the disposal cell cover.



TUB 4/2012. PL-8. East side slope of the disposal cell and the groundwater treatment plant facilities.



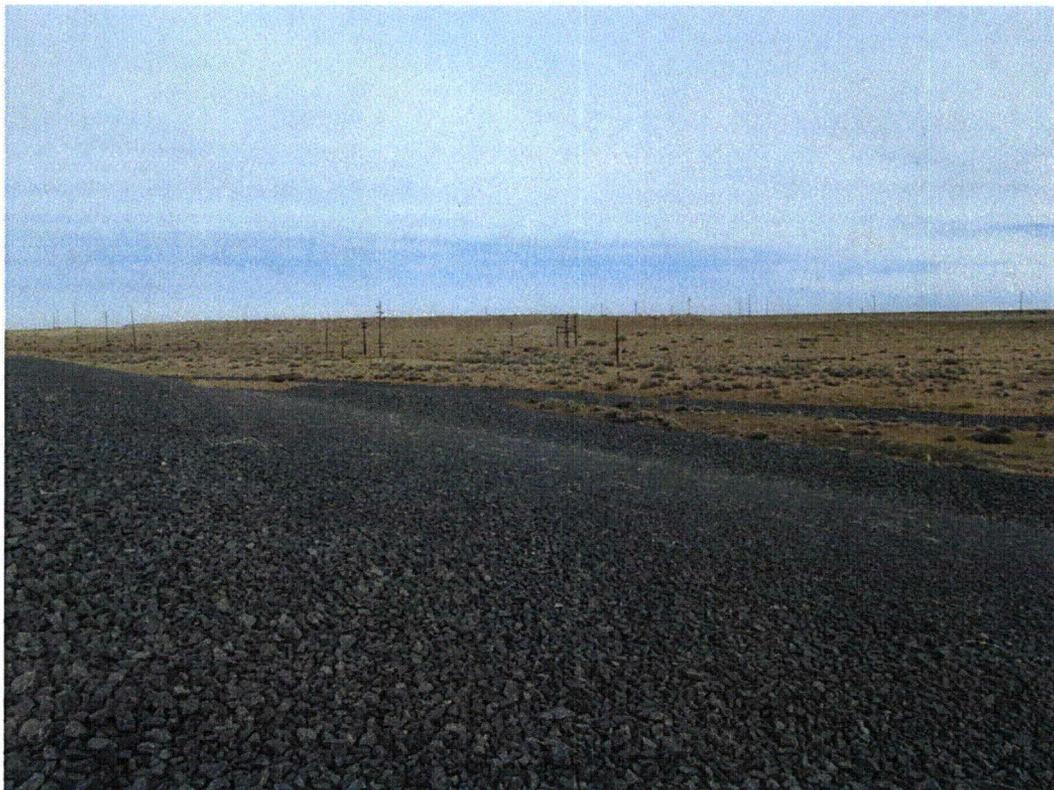
TUB 4/2012. PL-9. Vegetation encroachment on the south side slope of the disposal cell. Repeat photograph taken from extraction well 1107.



TUB 4/2012. PL-10. Vegetation encroachment on the south side slope of the disposal cell. Repeat photograph taken from extraction well 1105.



TUB 4/2012. PL-11. Vegetation encroachment on the south side slope of the disposal cell. Repeat photograph taken from monitoring well 0942.



TUB 4/2012. PL-12. North side slope of the disposal cell, apron ditch, and diversion channel.



TUB 4/2012. PL-13. Sand accumulation along the west fence line.



TUB 4/2012. PL-14. Windblown sand deposition on the south bank of the west diversion channel.
Repeat photograph taken from the footbridge.



TUB 4/2012. PL-15. East diversion channel and apron ditch viewed from the footbridge.