9.0 Lakeview, Oregon, Disposal Site

9.1 Compliance Summary

The Lakeview, Oregon, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site was inspected September 16 and 17, 2015. Other than some ongoing concern with erosion-control rock riprap degradation, the disposal cell was in good condition. Some minor fence repairs and vegetation removal, and minor erosion repair work along the west site fence is planned. Inspectors identified no other maintenance needs or cause for a follow-up or contingency inspection.

Disposal cell riprap is evaluated annually to ensure continued long-term protection of the cell from erosion during a severe precipitation event. Degradation of the rock riprap was first observed at the site in the mid-1990s. Rock gradation monitoring of the riprap on the west side slope has been performed as part of the annual inspection since 1997 to determine the mean diameter (D_{50}) value. As prescribed by the monitoring procedure, the rock monitoring is routinely conducted at random locations. However, at the U.S. Nuclear Regulatory Commission's (NRC's) request, the 2015 rock monitoring approach deviated from the normal procedure by using a pre-established monitoring grid in a subset area of the west side slope. This changed the monitoring approach from random sampling to biased sampling. The D_{50} value measured during the 2015 gradation monitoring is 2.39 inches, which falls below the original D_{50} design size range of 2.7–3.9 inches for the Type B size side slope riprap.

At NRC's request, rock durability monitoring was added to the gradation monitoring in 2009 to monitor durability by rock type. Results of the 2015 durability monitoring showed that74 percent of the total rock sampled is durability class code A rock with an assigned durability class of "highly durable" or durability class code B "durable" rock, and that over 90 percent of the 3-inch or larger rock is durability class code A or B. The rock durability classifications are further explained in Section 9.4.2.2.

9.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the *Long-Term Surveillance Plan for the Collins Ranch Disposal Site, Lakeview, Oregon* (LTSP) (DOE/AL/62350-19F, Rev. 3, U.S. Department of Energy [DOE], August 1994) and in procedures that DOE established to comply with the requirements of Title 10 *Code of Federal Regulations* Section 40.27 (10 CFR 40.27). These requirements are listed in Table 9-1.

Table 9-1. License Requirements for the Lakeview Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 6.0	Section 9.4
Follow-Up or Contingency Inspections	Section 7.0	Section 9.5
Maintenance and Repairs	Section 8.0	Section 9.6
Groundwater Monitoring	Section 5.3	Section 9.7
Corrective Action	Section 9.0	Section 9.8

9.3 Institutional Controls

The 40-acre site (Figure 9-1) is owned by the United States of America and was accepted under the NRC general license (10 CFR 40.27) in 1995. 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 physical features that are inspected annually: site markers, survey and boundary monuments, perimeter warning signs, a site perimeter fence, and locked gates at the site entrances.

9.4 Inspection Results

The site, located approximately 8 miles northwest of Lakeview, Oregon, was inspected on September 16 and 17, 2015. The inspection was conducted by C. Goodknight and K. Turley of the DOE Legacy Management Support contractor, and by G. Smith (Geo-Smith Engineering, LLC). T. Petrosky (DOE Site Manager), D. Engstrom (Oregon Department of Energy), and Z. Cruz and M. Meyer (NRC) also 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 report refer to items summarized in Table ES-1 of the "Executive Summary."

9.4.1 Site Surveillance Features

The locations of site surveillance features are shown on Figure 9-1. 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 9-1 by photograph location (PL) numbers.

9.4.1.1 Access Road, Entrance Gates, and Entrance Sign

Access to the site is gained by traveling a gravel road that heads west off County Road 2-16B. DOE was granted a perpetual easement on the approximately 1.2 mile access road between the county road and the DOE property boundary. A lockable gate across the access road on the adjacent privately owned land limits access to the site. The site access road was in good condition.

The site entrance gate and the pedestrian gate were locked and in good condition. The site's entrance sign was in good condition and clearly visible. No indication of recent vandalism was observed at the site during the inspection.

9.4.1.2 Perimeter Fence and Perimeter Signs

A wire fence is located along the site boundary. The perimeter fence was generally in good condition, but some loose and broken wire strands, and some loose t-posts, were noted. Tightening and minor maintenance of the fence, including the removal of involved vegetation (PL-1), is planned.

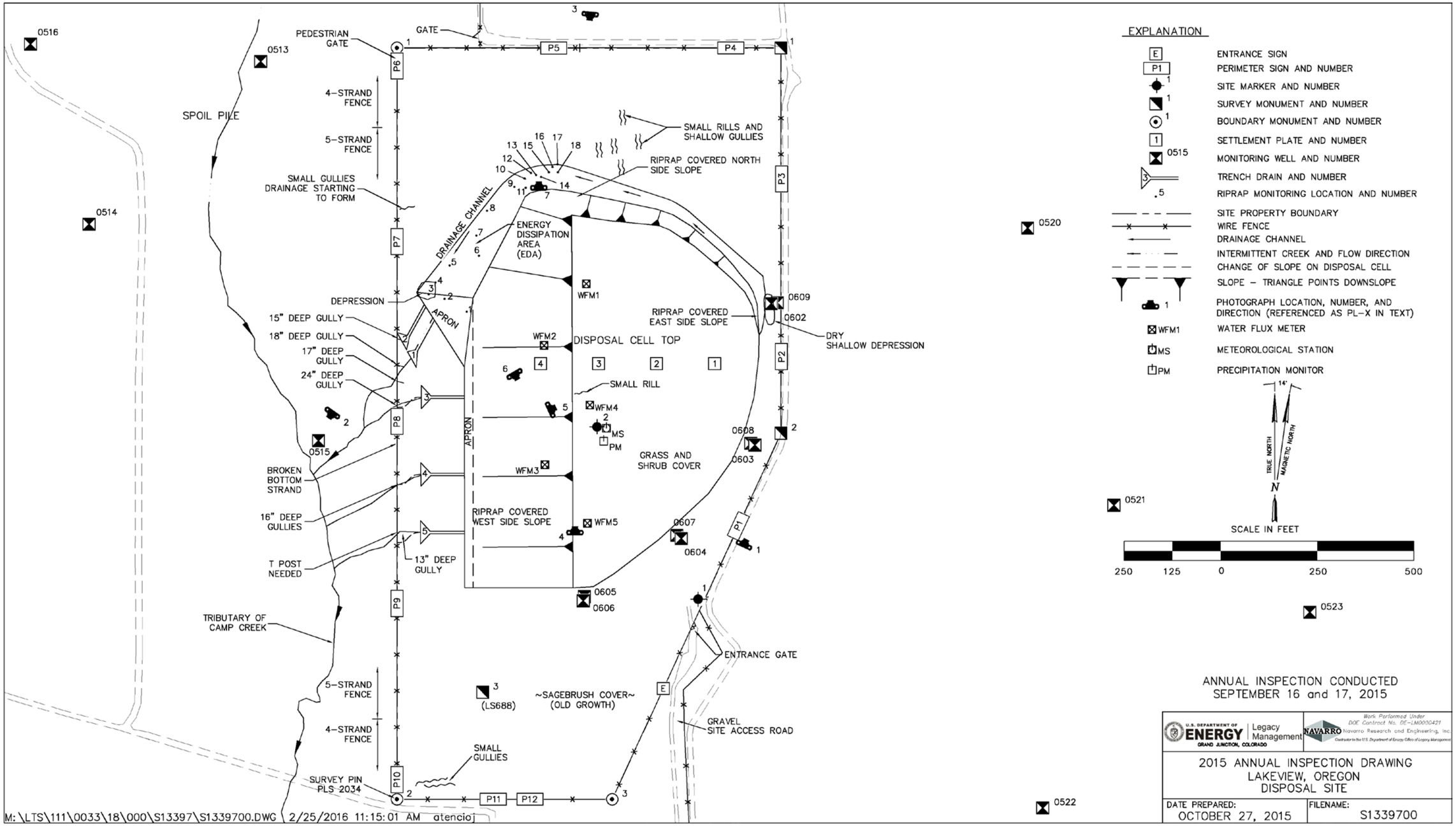

Figure 9-1. 2015 Annual Inspection Drawing for the Lakeview Disposal Site

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Twelve perimeter signs attached to steel posts set in concrete are along the perimeter fence. The signs were in good condition and clearly visible from outside the site.

9.4.1.3 Site Markers

The two site markers, SMK-1 near the site entrance and SMK-2 on top of the disposal cell, were in good condition.

9.4.1.4 Survey Monuments and Boundary Monuments

The three survey monuments and three boundary monuments were in good condition.

9.4.1.5 Monitoring Wells

The groundwater monitoring network comprises eight onsite point-of-compliance (POC) wells located east and south of the cell and one upgradient well (PL-2) located offsite to the west of the disposal site. All nine wells were inspected and were locked, labeled, and in good condition.

Seven additional DOE-owned monitoring wells exist on privately owned property near the site but are not part of the groundwater compliance monitoring network. These wells were also inspected and were locked, labeled, and in fair condition. Of the five offsite, non-POC wells with concrete surface pads, three of the pads were cracked or broken and had some soil undercutting from water and wind erosion.

9.4.2 Inspection Areas

In accordance with the LTSP, the site, shown in PL-3, is divided into three inspection areas to ensure a thorough and efficient inspection. The inspection areas are: (1) the top of the disposal cell; (2) the side slopes of the disposal cell and adjacent drainage channel, aprons, and trench drains; and (3) the site perimeter and the outlying area.

Within each area, the 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.

9.4.2.1 Top of Disposal Cell

At the time of cell construction, the entire cell top slope was covered in 12 inches of Type A size riprap, with 4 inches of soil placed over the riprap. The soil was included to allow for a grass cover to be established, which would help minimize the visual impacts of the cell. The design for the top of the disposal cell has created conditions that favor the growth of deep-rooted plants. The growth of shrubs is favored by movement of precipitation through the riprap, bedding, and compacted soil (radon barrier) layers. Grasses and forbs (rabbitbrush, sagebrush, and bitterbrush plants) growing on the top of the disposal cell have gradually increased over the years, and areas of deeper-rooted wheatgrasses have spread. Some sparsely vegetated areas still remain on the top of the disposal cell. In general, the vegetation at the site appeared to be drier in recent years, which would be expected given the drought conditions experienced in the region.

Riprap was observed through the soil on the top slope in numerous small areas during the inspection. The areas ranged in size from approximately 4 inches to 2.5 feet. These areas are sporadically located across the top slope and are likely caused by the infilling of the soil into the riprap-void spaces below. No structural or cell performance concerns are associated with the riprap becoming visible on the top slope.

The incipient development of soil checkerboard erosion patterns was observed sporadically in some of the more sparsely vegetated areas on the top slope; no changes were noted during this year's inspection. This minor erosion pattern could indicate that water on the top slope is attempting to channelize, or it could be associated with the soil settling into the riprap voids beneath the soil. No structural or cell performance concerns are associated with this condition because the riprap rock cover is continuous beneath the top-slope soil cover, the slope crests, and the side slopes. However, future inspections will monitor this condition.

The contact boundary between the cell top and side slopes (PL-4) was inspected and generally appears stable and uniform except at the northwest corner of the cell top, where some soil has been transported off the top slope, allowing for some grass to establish at the top of the side slopes. One minor erosion rill was observed along the west edge (slope crest) of the top slope during this inspection (see Figure 9-1 and PL-5). No structural or cell performance concerns are associated with the minor encroachment of the grass onto the side slope or the presence of the minor rill because the riprap rock cover is continuous beneath the top-slope soil cover, the slope crests, and the side slopes. The extent of rilling along the slope crest will continue to be monitored.

No evidence of active animal burrowing on the top slope or evidence of cell settlement, displacement, or slumping was observed during the inspection.

9.4.2.2 Disposal Cell Side Slopes and Adjacent Drainage Channel, Aprons, and Trench Drains

Deterioration of the basalt rock riprap is occurring and is likely due to physical weathering and chemical processes. The crumbling rocks on the surface appear to have increased in the mid-1990s, and rock monitoring continues to be performed.

Addendums to the LTSP commit DOE to annually determining the D_{50} value of the west side slope rock riprap through gradation monitoring to ensure that the riprap is large enough to protect the disposal cell from erosion during a major precipitation event. This gradation monitoring method measures the number of rocks retained per sieve size. With NRC's consent, an additional sieve size (1 inch) has been included in the monitoring since 2009. Normally, **s**ampling locations are randomly selected before each monitoring event. However, for the 2015 inspection, the rock monitoring approach deviated from the normal procedure, at NRC's request, by using a pre-established monitoring grid in a subset area of the west side slope (see Figure 9-1). This changed the sampling approach from random to biased, thus potentially compromising data comparability. Particle size distribution by count data was collected at 20 locations, and approximately 25 rocks were sampled at each location. Monitoring on the west side slope is shown in PL-6.

9A DOE committed to performing annual rock durability monitoring in a letter to NRC dated October 17, 2008.[1] Rock durability monitoring was conducted to quantify the various rock types and durability classes of the basalt rock on the west side slope. The rock durability monitoring was performed in 2015 for a seventh consecutive year using the rock type classifications developed for the site as shown in Table 9-2. This table identifies the rock types, which are representative of the rocks found on the side slopes, provides rock descriptions, and assigns a durability class and code (ranging from "highly durable" to "nondurable – crumbled/rubblized"). The Table 9-2 durability classes were assigned by a geologist/mineralogist's examination of the rocks.

Table 9-2 consists of eight durability classes (A, B, Ca, Cb, Da, Db, E, and F). As requested by NRC, starting with the 2010 monitoring, Durability Class A rocks were divided into four subclasses: unfractured (Au); hairline fractured (Ah*, where the number in place of the asterisk indicates the number of fractures present [e.g., Ah3]); open fractured (Ao*, where the number in place of the asterisk indicates the number of fractures present [e.g., Ao3]); and a rock that had split since placement on the cell (As). The 2010 table (Table 9-2) was retained for the subsequent durability monitoring events.

The rock durability monitoring was performed in conjunction with the gradation monitoring with the same rock being used for both types of monitoring. After the size of a rock was determined, the rock was handed to a geologist/mineralogist for rock type identification using Table 9-2. The associated durability class (or subclass) code was then recorded under the appropriate rock size column for that sample location.

Table 9-3 provides the results of the 2015 durability monitoring by rock count and shows the correlation between rock size and durability class. Table 9-4 provides the percentage of each durability class by sieve size. Table 9-5 shows the percentage of sieve size by durability class.

General observations about the data include:

- Seventy-four percent of the total rock sampled is durability class code A "highly durable" or durability class code B "durable."
- Over 70 percent of the 4 inch or larger rock is durability class code B "durable."
- Over 90 percent of the 3 inch or larger rock is durability class code A or B.
- Over 80 percent of the 1.5 inch or larger rock is durability class code A or B.
- The smallest rock (less than 1 inch) is mostly durability class code Da "susceptible to near-term degradation."
- Only 6.8 percent of the rock in this biased sample is "moderately durable" (durability class codes Ca and Cb), and less than 18 percent of the total sampled rock is "susceptible to near-term degradation" (durability class codes Da and Db).

The annual photographic monitoring of the 18 photograph locations for long-term rock monitoring was conducted in the energy dissipation area (EDA). The rock at photo-monitoring location 12 is shown in PL-7. Minor rock degradation has been observed since monitoring began at the original 10 photograph locations established in 1997 and at the eight additional locations established in 2000. The rock used in the EDA and drainage channel areas is much more

[1] Jalena Dayvault, DOE Site Manager, Lakeview, Oregon, Disposal Site, LM, DOE, letter (about NRC suspension of revised LTSP [August 2002], Lakeview, Oregon, UMTRCA Title I Disposal Site) to Myron Fliegal, Senior Project Manager, NRC, October 17, 2008.

homogeneous (predominantly Class Code B rock type) than the varied rock used on the side slopes, and appeared in good condition.

Water previously observed at times in the large depression in the EDA at the lower end of the drainage channel was absent. Water is potentially a concern because inundation might accelerate deterioration of the large riprap by the freeze-thaw process, although the rock used in the EDA is apparently not as susceptible to freeze-thaw as other rock types present on the cell.

Table 9-2. Rock Types and Durability Classes and Subclasses

Rock Type Identification Number	Rock Type Description	Durability Class	Durability Class Code	Durability Subclass Code
1	Dense, hard, very fine-grained, dark gray basalt with no joints, fractures, white deposits, or alteration.	Highly Durable	A	Au
	As above in Au, except with tight, hairline fracture(s). Asterisk indicates the number of tight, hairline fractures.		A	Ah*
	As above in Au, except with open fracture(s). Asterisk indicates the number of open fractures in the rock that are ready to split.		A	Ao*
	As above in Au, except that the rock has split along fractures since placement on the cover, but the rocks are still in place.[1]		A	As
2	Dense, hard, dark gray to grayish brown, olivine basalt. No joints or white deposits; olivine phenocrysts have altered to amber and brown material representing various minerals such as iddingsite, antigorite, chlorite, and nontronite. On some exposed surfaces, altered olivine phenocrysts have weathered out to give a vesicular appearance.	Durable	B	----
3a	Dense, fine-grained, grayish brown to brown basalt with hairline fractures. Basalt is slightly altered and fractured outer surfaces have a brown, limonite-like coating.	Moderately Durable	Ca	----
3b	Greenish gray to green, dense basalt with hairline fractures. Some fractures may have white or light brown coatings. Deuteric and hydrothermal alteration have imparted a distinctive greenish cast to the basalt resulting from alteration of calcic plagioclase to the more sodic plagioclase, albite-oligoclase.	Moderately Durable	Cb	----
4a	Fine-grained, highly fractured gray to greenish gray basalt. Hairline to open fractures are mostly coated with white to pink calcite and commonly with the zeolite mineral, analcime.	Susceptible to Near-Term Degradation	Da	----
4b	Greenish gray to grayish brown olivine basalt that is highly fractured. Olivine phenocrysts have altered to brown material, possibly nontronite.	Susceptible to Near-Term Degradation	Db	----
5	Fine- to medium-grained, soft, grayish green, highly altered basalt. Rock has a granular appearance, has relatively low specific gravity, is probably highly chloritized, and it has commonly disintegrated (rubblized) into pieces smaller than 1 inch in diameter.	Nondurable - Crumbled/ Rubblized	E	----
6	Non-basaltic rocks such as sandstone or quartzite.	Highly Durable to Nondurable	F	----

[1] "As" must be determined while the rocks are still in place on the side slope before the rocks are picked up for gradation monitoring. The size of the monitored rock reflects the size of the selected/marked split piece, not the size of the pre-split rock.

Table 9-3. 2015 Durability Monitoring – Percent of Total Rock Count by Durability Class and Sieve Size

Durability Class & Subclass	Rock Count by Sieve Size (Retained on Sieve)						Total By Durability Class	Percent of Total
	4 Inch	3 Inch	2.5 Inch	1.5 Inch	1 Inch	< 1 Inch		
Class Au	1	9	12	48	18	6	94	19.3
Class As	1	0	0	2	1	0	4	0.8
Class Ao1	0	6	2	15	2	0	25	5.1
Class Ao2	0	8	8	4	1	0	21	4.3
Class Ao3	0	0	0	0	0	0	0	0
Class Ao4	0	0	0	0	0	0	0	0
Class Ao5	0	0	0	0	0	0	0	0
Class Ah1	2	15	17	23	2	0	59	12.1
Class Ah2	1	6	4	10	1	0	22	4.5
Class Ah3	0	1	0	1	0	0	2	0.4
Class Ah4	0	0	0	0	0	0	0	0
Total A Class	5	45	43	103	25	6	227	46.5
Class B	17	53	28	31	5	0	134	27.5
Class Ca	0	0	5	9	5	3	22	4.5
Class Cb	0	0	0	6	3	2	11	2.3
Class Da	1	6	10	28	16	11	72	14.8
Class Db	1	3	1	6	0	4	15	3.1
Class E	0	0	0	0	1	6	7	1.4
Class F	0	0	0	0	0	0	0	0
Total by Sieve Size	24	107	87	183	55	32	488	–
Percent of Total	4.9	21.9	17.8	37.5	11.3	6.6	100	–
Total by Durability Class	–	–	–	–	–	–	488	100

Table 9-4. 2015 Durability Monitoring – Percent Durability Class by Sieve Size

Durability Class & Subclass	Percent by Sieve Size (Retained on Sieve)					
	4 Inch	3 Inch	2.5 Inch	1.5 Inch	1 Inch	< 1 Inch
Class Au	4.2	8.4	13.8	26.2	32.7	18.8
Class As	4.2	0.0	0.0	1.1	1.8	0.0
Class Ao1	0.0	5.6	2.3	8.2	3.6	0.0
Class Ao2	0.0	7.5	9.2	2.2	1.8	0.0
Class Ao3	0.0	0.0	0.0	0.0	0.0	0.0
Class Ao4	0.0	0.0	0.0	0.0	0.0	0.0
Class Ao5	0.0	0.0	0.0	0.0	0.0	0.0
Class Ah1	8.3	14.0	19.5	12.6	3.6	0.0
Class Ah2	4.2	5.6	4.6	5.5	1.8	0.0
Class Ah3	0.0	0.9	0.0	0.5	0.0	0.0
Class Ah4	0.0	0.0	0.0	0.0	0.0	0.0
Total A Class	20.9	42.0	49.4	56.3	45.3	18.8
Class B	70.8	49.5	32.2	16.9	9.1	0.0
Class Ca	0.0	0.0	5.7	4.9	9.1	9.4
Class Cb	0.0	0.0	0.0	3.3	5.4	6.3
Class Da	4.2	5.6	11.5	15.3	29.1	34.4
Class Db	4.2	2.8	1.2	3.3	0.0	12.5
Class E	0.0	0.0	0.0	0.0	1.8	18.8
Class F	0.0	0.0	0.0	0.0	0.0	0.0
Total Percent	100	100	100	100	100	100

Table 9-5. 2015 Durability Monitoring – Percentage Sieve Size by Durability Class

Durability Class & Subclass	Percent By Sieve Size (Retained on Sieve)						Total Percent
	4 Inch	3 Inch	2.5 Inch	1.5 Inch	1 Inch	< 1 Inch	
Class Au	1.1	9.6	12.8	51.1	19.1	6.4	100
Class As	25.0	0.0	0.0	50.0	25.0	0.0	100
Class Ao1	0.0	24.0	8.0	60.0	8.0	0.0	100
Class Ao2	0.0	38.1	38.1	19.0	4.8	0.0	100
Class Ao3	0.0	0.0	0.0	0.0	0.0	0.0	0
Class Ao4	0.0	0.0	0.0	0.0	0.0	0.0	0
Class Ao5	0.0	0.0	0.0	0.0	0.0	0.0	0
Class Ah1	3.4	25.4	28.8	39.0	3.4	0.0	100
Class Ah2	4.5	27.3	18.2	45.5	4.5	0.0	100
Class Ah3	0.0	0.0	0.0	0.0	0.0	0.0	0
Class Ah4	0.0	50.0	0.0	50.0	0.0	0.0	100
Total A Class	2.2	19.8	18.9	45.4	11.0	2.6	100
Class B	12.7	39.6	20.9	23.1	3.7	0.0	100
Class Ca	0.0	0.0	22.8	40.9	22.8	13.6	100
Class Cb	0.0	0.0	0.0	54.5	27.3	18.2	100
Class Da	1.4	8.3	13.9	38.9	22.2	15.3	100
Class Db	6.7	20.0	6.7	40.0	0.0	26.7	100
Class E	0.0	0.0	0.0	0.0	14.3	85.7	100
Class F	0.0	0.0	0.0	0.0	0.0	0.0	0

Minor amounts of grass have encroached on the riprap on the side slopes, on the upper (eastern) part of the drainage channel, on the EDA at the lower end of the drainage channel, and on the western apron area. This relatively sparse plant growth will not affect the function of the erosion control features and is not considered a problem. A few small bushes are located in the upgradient portion of the drainage channel, but their presence will not obstruct water flow. This location is evaluated during each inspection. Should the potential for flow obstruction become a concern in the future, maintenance activities would be performed. An area of dense, high grass exists near trench drains 1 and 3, which suggests wetter conditions that would periodically occur in this area due to the presence of the runoff control features. No ponded water was observed. Some sporadic areas of soil cracking were observed in soils in the areas west of the trench drains, but the grasses covering this area are dense and provide erosion protection.

No evidence of active animal burrowing on the side slopes or evidence of cell settlement, displacement, or slumping was observed during the inspection.

9.4.2.3 Site Perimeter and 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. This includes the seeded grass area extending from the disposal cell to the site boundary and the site perimeter fence.

Gullies that formed in seeded areas extending west of trench drains 1 through 5 were filled with rock in 2000. Although the rock has generally arrested the head cutting that was advancing eastward from the private property onto the DOE property, some minor head cutting is still evident but it did not appear to be recent. Several small gullies have formed in heavily grazed areas downslope of the fence line onto the private property and were identified during previous inspections. One area, just north of perimeter sign P7, where a small drainage appeared to be forming on the DOE site in this area was noted for the first time during this inspection (Figure 9-1). None of these gullies or the small drainage pose a threat to cell integrity. Minor erosion maintenance work is planned for the on-site features.

Small gullies were identified in past years along the southern side of the site inside the fence. These gullies are located downhill of a west-sloping road just south of the fence line. The gullies likely represent overflow along the road during rain events. This area has not shown evidence of recent erosion. No maintenance is required in this area.

Several small rills and shallow gullies were observed onsite in the area north of the cell, where grass reestablishment has been limited, but appear unchanged from the previous inspection. No maintenance is required in this area, but the area will continue to be monitored.

9.5 Follow-Up or Contingency 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.

9.6 Maintenance and Repairs

No maintenance was conducted in 2015. Minor repairs to the perimeter fence, removal of vegetation from the fence, and some minor preventive on-site erosion maintenance along the west property fence are planned.

9.7 Groundwater Monitoring

9B DOE monitors groundwater quality in the uppermost aquifer at this site once every 5 years to demonstrate that the disposal cell is not leaching contaminants into the aquifer. The most recent sampling event was performed in May 2014.

Nine monitoring wells are in the groundwater monitoring network. Eight POC wells (four monitoring well pairs: 0602/0609, 0603/0608, 0604/0607, and 0605/0606) are east and south of the cell. Upgradient well 0515 is west of the disposal site. Monitoring wells 0602, 0603, 0604, and 0605 continued to be dry and could not be sampled.

Seven additional DOE-owned monitoring wells (0513, 0514, 0516, 0520, 0521, 0522, and 0523) exist on privately owned property near the site but are not sampled because they are not part of the groundwater compliance monitoring network.

Constituents analyzed every 5 years include arsenic, cadmium, and uranium. Their maximum concentration limits (MCLs), established by the U.S. Environmental Protection Agency in Table 1 to Subpart A of 40 CFR 192, are 0.05 milligram per liter (mg/L) for arsenic, 0.01 mg/L for cadmium, and 0.044 mg/L for uranium. Concentrations of these constituents continued to remain significantly below their respective limits in 2014. Arsenic concentrations were similar to the 2009 results (Figure 9-2), and all but one cadmium concentration result were below the laboratory detection limit of 0.00012 mg/L (Figure 9-3), and uranium concentrations remained stable or slightly increased (Figure 9-4). Based on the monitoring results to date, there is no indication of any degradation of groundwater near the site. The next cell performance monitoring is scheduled for 2019.

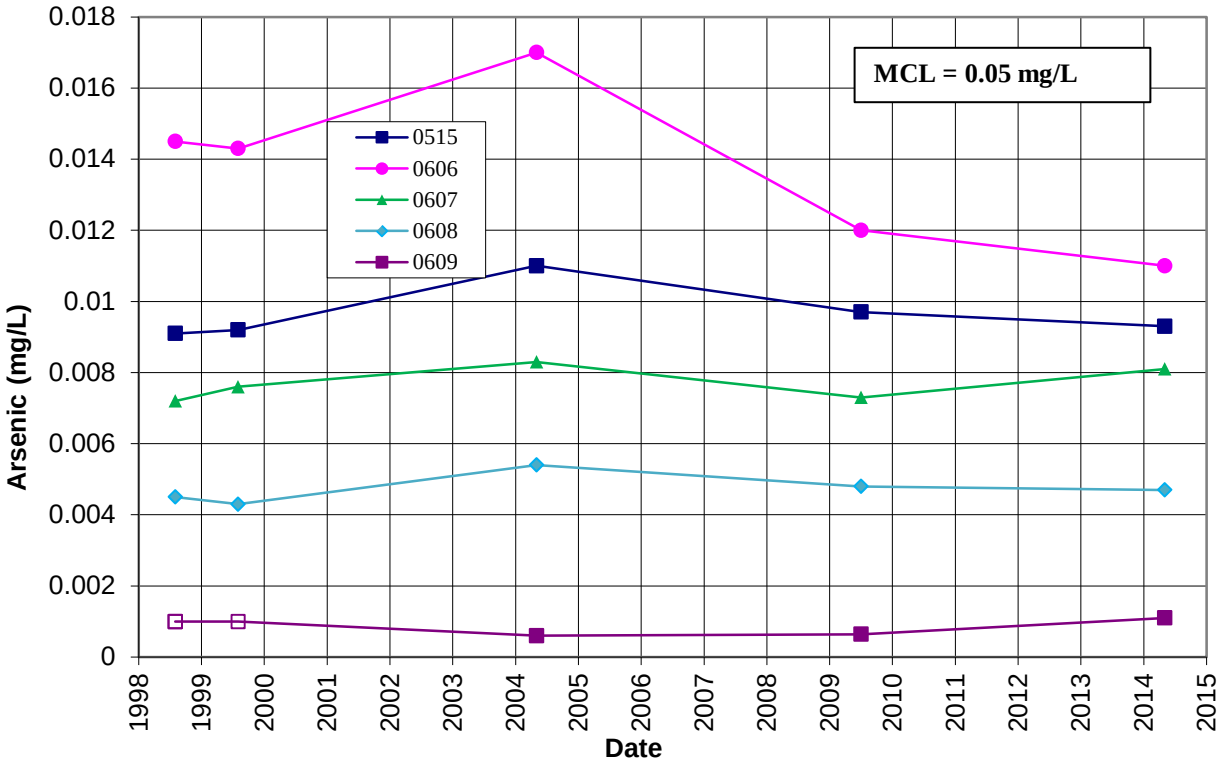


Figure 9-2. Time-Concentration Plot of Arsenic in Groundwater at the Lakeview Disposal Site

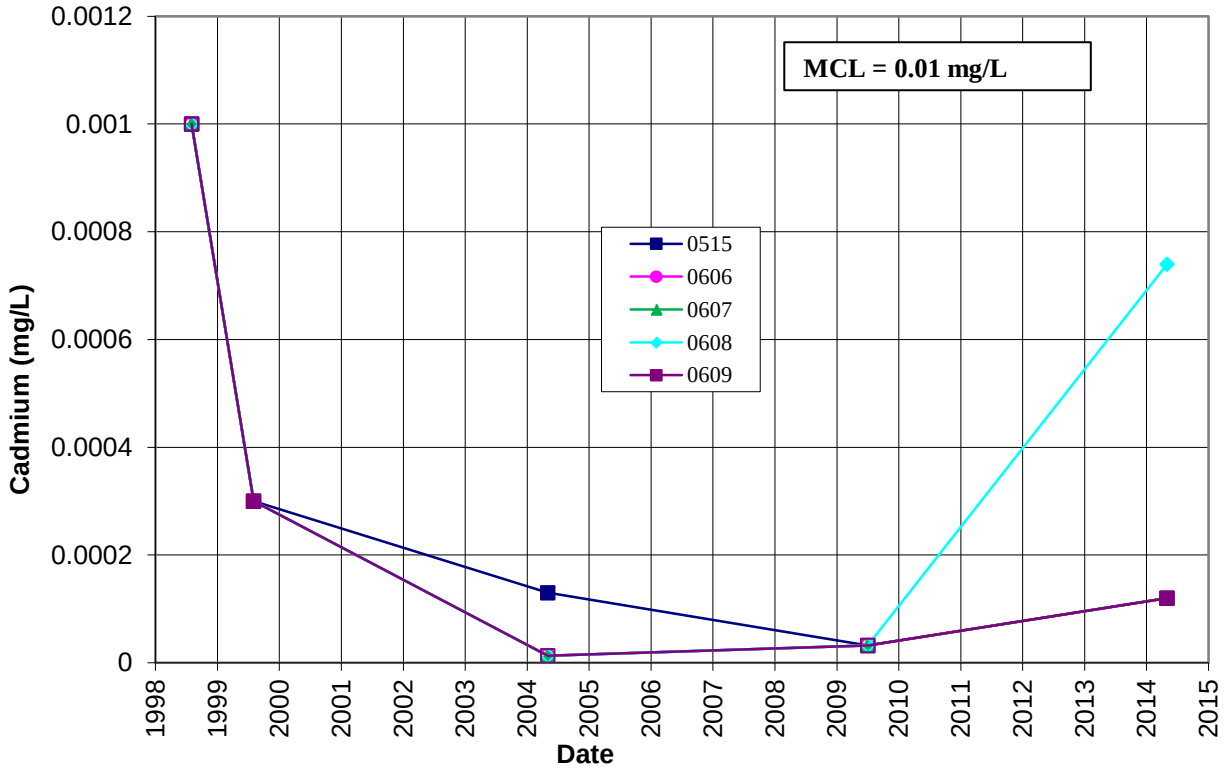


Figure 9-3. Time-Concentration Plot of Cadmium in Groundwater at the Lakeview Disposal Site

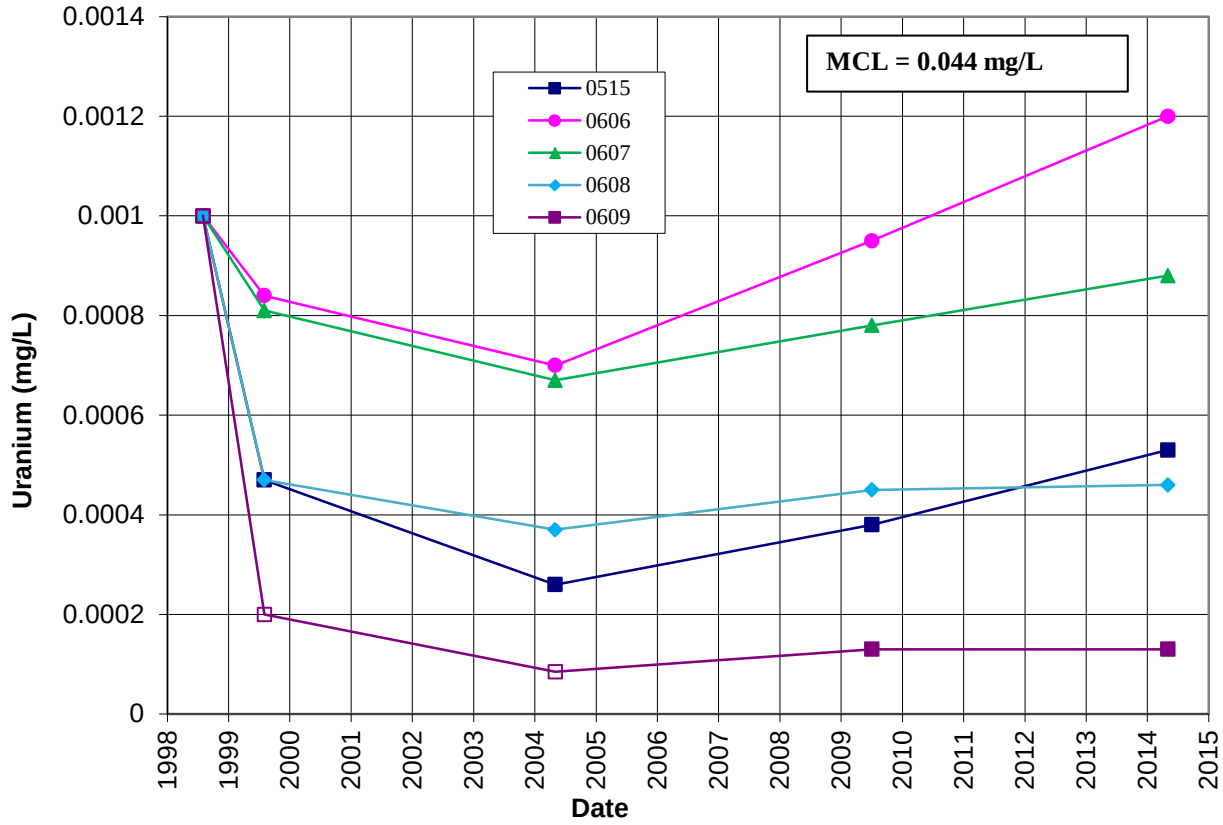


Figure 9-4. Time-Concentration Plot of Uranium in Groundwater at the Lakeview Disposal Site

9.8 Corrective Action

In accordance with the LTSP, corrective action is taken to correct conditions that threaten the integrity of the disposal cell or compliance with 40 CFR 192. No need for corrective action was identified.

9.9 Photographs

Photograph Location Number	Azimuth	Photograph Description
PL-1	25	View north-northeast of vegetation growth along fence.
PL-2	215	Well 0515.
PL-3	185	View south of disposal cell top and west side slope.
PL-4	0	View north along transition zone from cell top to west side slope.
PL-5	65	View northeast of shallow rill along transition zone.
PL-6	150	View southeast of inspectors, a Geo-Smith Engineering representative, and a State of Oregon representative performing rock monitoring at monitoring location 13.
PL-7	NA	Riprap photo-monitoring location 12 in the EDA.

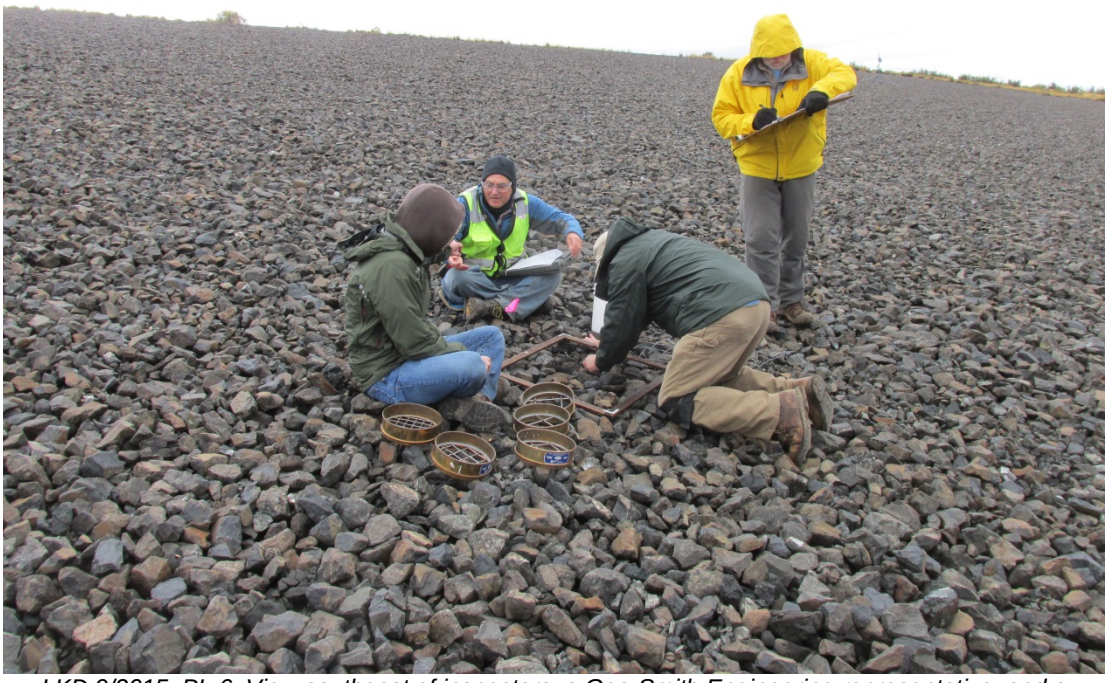
LKD 9/2015. PL-1. View north-northeast of vegetation growth along fence.

LKD 9/2015. PL-2. Well 0515.

LKD 9/2015. PL-3. View south of disposal cell top and west side slope.

LKD 9/2015. PL-4. View north along transition zone from cell top to west side slope.

LKD 9/2015. PL-5. View northeast of shallow rill along transition zone.



LKD 9/2015. PL-6. View southeast of inspectors, a Geo-Smith Engineering representative, and a State of Oregon representative, performing rock monitoring at monitoring location 13.

LKD 9/2015. PL-7. Riprap photo-monitoring location 12 in the EDA.

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