

## 11.0 Maybell, Colorado, Disposal Site

### 11.1 Compliance Summary

The Maybell, Colorado, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site was inspected on September 2, 2021. Standing water was observed in the disposal cell apron on the eastern toe slope. Inspectors identified several minor maintenance needs but found no cause for a follow-up inspection. Groundwater monitoring is not required.

### 11.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the site-specific Long-Term Surveillance Plan (DOE 2008) (LTSP) in accordance with procedures established to comply with the requirements of the U.S. Nuclear Regulatory Commission (NRC) general license at Title 10 *Code of Federal Regulations* Section 40.27 (10 CFR 40.27). Table 11-1 lists these requirements.

*Table 11-1. License Requirements for the Maybell, Colorado, Disposal Site*

Requirement	LTSP	This Report	10 CFR 40.27
Annual Inspection and Report	Sections 3.3 and 3.4	Section 11.4	(b)(3)
Follow-Up Inspections	Section 3.5	Section 11.5	(b)(4)
Maintenance	Section 3.6	Section 11.6	(b)(5)
Emergency Measures	Section 3.6	Section 11.7	(b)(5)
Environmental Monitoring	Section 3.7	Section 11.8	(b)(2)

### 11.3 Institutional Controls

The 251-acre site, identified by the property boundary shown in Figure 11-1, is owned by the United States and was accepted under the NRC general license in 1999. The U.S. Department of Energy (DOE) is the licensee and, in accordance with the requirements for UMTRCA Title I sites, the Office of Legacy Management (LM) is responsible for the custody and long-term care of the site. Institutional controls (ICs) at the site include federal ownership of the property, administrative controls, and the following physical ICs that are inspected annually: the disposal cell and associated drainage features, entrance gate and sign, perimeter fence and perimeter (warning) signs, site markers, and survey and boundary monuments.

### 11.4 Inspection Results

The site, 25 miles west of Craig, Colorado, was inspected on September 2, 2021. The inspection was conducted by J. Cario and B. Mays of the Legacy Management Support contractor. M. Cosby (Colorado Department of Public Health and Environment) attended the inspection. The purposes of the inspection were to confirm the integrity of visible features at the site, identify changes in conditions that might affect conformance with the LTSP, and evaluate whether maintenance or additional inspection and monitoring are needed.

## 11.4.1 Site Surveillance Features

Figure 11-1 shows the locations of site features, including site surveillance features and inspection areas, in black and gray font. Site features that are present but not required to be inspected are shown in italic font. Observations from previous inspections that are currently monitored are shown in blue text, and new observations identified during the 2021 annual inspection are shown in red. 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 11-1 by photograph location (PL) numbers. The photographs and photograph log are presented in Section 11.10.

### *11.4.1.1 Access Road, Entrance Gate, and Entrance Sign*

Access to the site is from the gravel-surfaced Moffat County Road 53, which runs north from U.S. Highway 40 approximately 8 miles east of Maybell, Colorado. County Road 53 ends at an unlocked gate near the northeast corner of the site (approximately 3 miles from the highway). The road continues west as a dirt two-track road directly north of the site. From the end of County Road 53 to the site entrance gate (and beyond, to the UMRCA Title II Maybell West, Colorado, Disposal Site), LM is responsible for road maintenance under a U.S. Bureau of Land Management right-of-way permit. Entrance to the site is through two locked, metal stock gates in the perimeter fence. One is the entrance gate (PL-1), which is adjacent to the site marker and entrance sign. The second gate is between perimeter signs P3 and P4 in the northwest corner of the property. Both gates were locked and functional. The entrance sign is near the entrance gate and is mounted on a T-post in the perimeter fence (PL-2). The entrance sign has bullet damage but remains legible. No maintenance needs were identified.

### *11.4.1.2 Perimeter Fence and Signs*

To facilitate LM's land management, a four-strand barbed-wire perimeter fence encloses the disposal cell, drainage structures, and much of the site. The site is in wintering grounds frequented by big-game animals (primarily pronghorn, deer, and elk) and is also surrounded by open range used to graze cattle. Minor damage to the perimeter fence from animal contact periodically occurs. On July 27, 2021, plastic fence flags were attached to the top strand of the perimeter fence to alert wildlife and reduce animal entanglements or strikes against fence lines (PL-3).

There are 26 perimeter signs. On the north, west, and south sides of the site, perimeter signs are attached to T-posts in the perimeter fence. On the east side of the site, perimeter signs are attached to steel posts set in concrete and are inside the property boundary approximately midway between the disposal cell and the perimeter fence (PL-4). Several of the perimeter signs along the dirt road north and west of the site (P5, P6, P8, and P11) have bullet damage but remain legible. Perimeter sign P16 is faded, and perimeter sign P26 was missing. Perimeter signs P16 and P26 will be replaced during the next routine maintenance event. No other maintenance needs were identified.

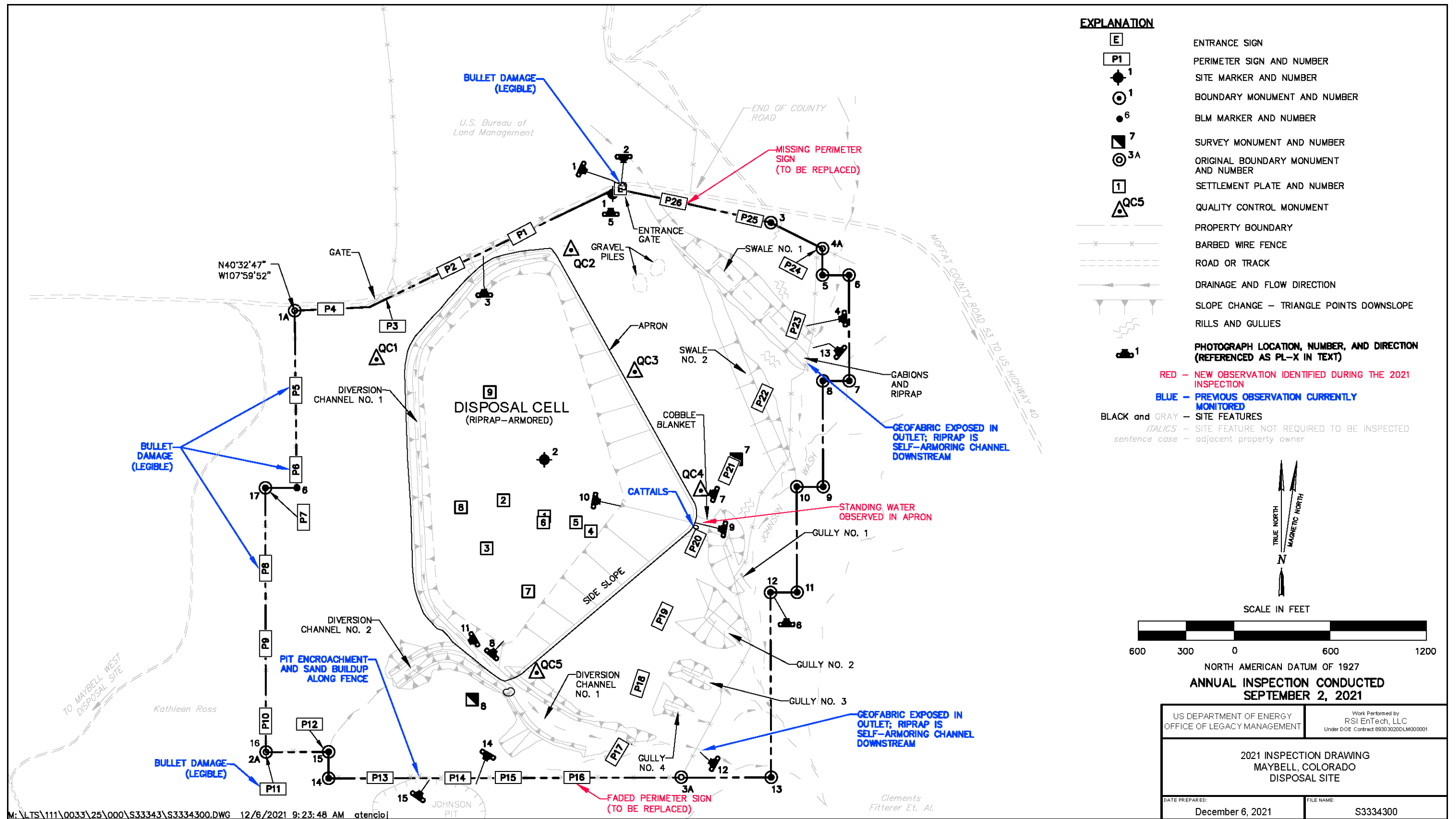


Figure 11-1. 2021 Annual Inspection Drawing for the Maybell, Colorado, Disposal Site

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### ***11.4.1.3 Site Markers***

The site has two granite site markers. Site marker SMK-1 is just inside the entrance gate (PL-5), and site marker SMK-2 is on the top slope of the disposal cell. No maintenance needs were identified.

### ***11.4.1.4 Survey and Boundary Monuments***

The site has two survey monuments. Survey monument SM-7 is on the bench above Johnson Wash just north of perimeter sign P21, and survey monument SM-8 is south of the disposal cell on the bench above Diversion Channel No. 2. The two survey monuments are historical site features that are difficult to locate. They were not inspected during the 2021 inspection but were confirmed to be present and intact during a site visit in 2019. Seventeen boundary monuments delineate the property boundary (PL-6). No maintenance needs were identified.

### ***11.4.1.5 Aerial Survey Quality Control Monuments***

Five aerial survey quality control monuments were inspected during the 2021 inspection (PL-7). No maintenance needs were identified.

## **11.4.2 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. The inspection areas are (1) the disposal cell, (2) other areas inside the site boundary, and (3) the outlying area. Inspectors examined the specific site surveillance features within each area and looked for evidence of erosion, settling, slumping, or other modifying processes that might affect the site’s conformance with LTSP requirements.

### ***11.4.2.1 Disposal Cell***

The disposal cell, completed in 1998, occupies 66 acres; it is armored with riprap to control erosion and deter animal and human intrusion (PL-8). There was no evidence of erosion, settling, slumping, rock degradation, or other modifying processes that might affect the integrity of the disposal cell. Scattered shallow-rooted plants continue to establish on the disposal cell top and side slopes; these plants do not affect the integrity of the cell. Deep-rooted plants and noxious weeds are controlled as required by the LTSP.

In accordance with the LTSP, inspectors looked for seeps on the east and southeast side slopes of the disposal cell, because slimes were encapsulated in this portion of the cell. No seeps were observed at the toe of the disposal cell in these areas. Stormwater runoff from the disposal cell discharges at this location, and standing water was observed in the easternmost portion of the disposal cell toe slope apron upgradient of the cobble blanket (PL-9 and PL-10). A storm was recorded in the area a few days before the annual inspection, and standing water has been observed at this location in the past. A 2003 laboratory analysis of evaporite minerals from this location confirmed that no constituents attributable to the disposal cell contents were present. No other maintenance needs were identified.

### ***11.4.2.2 Other Areas Inside the Site Boundary***

Surface conditions at the site are a combination of rock-armored drainage and diversion channels, along with contouring of soil surfaces to achieve the necessary surface water drainage control to protect the disposal cell from erosion. The rock-armored diversion channels (PL-11), swales, and gullies are performing as designed. Erosion directly downgradient of the outlets of Diversion Channel No. 1 (PL-12) and Swale No. 1 (PL-13) has exposed the underlying geofabric, but that exposure had not changed significantly since the 2020 inspection. Riprap placed in the outlets continues to protect against headcutting. Minor rills adjacent to Swale No. 1 and Gully No. 1 continue to stabilize as a result of natural armoring and increased vegetation growth. Minor erosion on the northern portion of the site directly downslope of the perimeter fence between perimeter signs P1 and P2 continues to stabilize. Minor erosion perpendicular to the perimeter fence near boundary monument BM-3 continues to be monitored, with no significant changes observed during the annual inspection. Documented erosion does not threaten the disposal cell, and there was no evidence of sediment moving offsite into Johnson Wash. No maintenance needs were identified.

### ***11.4.2.3 Outlying Area***

The area beyond the site boundary for a distance of 0.25 mile was visually observed for erosion, changes in land use, or other phenomena that might affect the long-term integrity of the site. No such impacts were observed.

Directly south of the site is a former open-pit uranium mine known as the Johnson Pit (PL-14). Over time, slumping of the pit wall caused the pit to encroach several feet onto property now owned by DOE. This encroachment presents no threat to the integrity of the disposal cell and occurred before reclamation and transfer of the site to DOE for long-term surveillance and maintenance. This encroachment is visually monitored annually; it is periodically documented with photographs to assess whether the pit wall has slumped further and to verify the integrity and functionality of the perimeter fence. At the time of the inspection, there was no evidence of any additional encroachment of the pit onto the site. However, windblown sand continues to accumulate along the northern crest of the pit wall along the perimeter fence line (PL-15). The perimeter fence remains functional, but continued accumulation of sand will require vertically extending the fence or removing the sand. Inspectors will continue to monitor this area. No immediate maintenance needs were identified.

## **11.5 Follow-Up Inspections**

LM will conduct follow-up inspections if (1) a condition is identified during the annual inspection or other site visit that requires a return to the site to evaluate the condition or (2) LM is notified by a citizen or outside agency that conditions at the site are substantially changed. No need for a follow-up inspection was identified.

## **11.6 Maintenance**

Vegetation treatment of noxious weeds and deep-rooted plants on the disposal cell was performed before the 2021 inspection. Perimeter signs P16 and P26 will be replaced during the next routine maintenance event. No other maintenance needs were identified.

## 11.7 Emergency Measures

In compliance with the LTSP, emergency measures are the actions that LM will take in response to unusual damage or disruption that threatens or compromises site safety, security, or integrity. No need for emergency measures was identified.

## 11.8 Environmental Monitoring

### 11.8.1 Groundwater Monitoring

In accordance with the LTSP, groundwater monitoring is not required. Supplemental standards have been applied to site groundwater because it is designated as limited use—a designation given to groundwater that is not a current or potential source of drinking water. Groundwater in the uppermost aquifer is designated as limited use because it contains widespread ambient contamination that cannot be cleaned up by treatment methods employed in public water systems (40 CFR 192.11[e]). There are no current or future uses of the uppermost aquifer in the area. Water level monitoring, conducted from 1995 through 2004, did not detect disposal-cell-related impacts to the groundwater system, such as transient drainage downgradient of the cell, and NRC concurred that stipulated groundwater level monitoring requirements had been satisfied (Janosko 2005). Therefore, no further groundwater monitoring was required.

### 11.8.2 Vegetation Monitoring

In accordance with the LTSP, visual inspections are conducted annually to verify the continued health of onsite vegetation and to ensure that undesirable plant species (e.g., deep-rooted plants on the disposal cell cover and noxious weeds) do not proliferate onsite. No noxious weeds or deep-rooted plants were noted on the disposal cell during the inspection. Noxious weed treatment was performed on July 27, 2021, and will continue annually, as needed. Following reclamation, the disturbed soil surfaces on the site were revegetated with a mix of native and adaptive grasses to provide soil stability. These revegetated areas appeared to be healthy, with similar diversity and density as the surrounding nondisturbed areas.

## 11.9 References

10 CFR 40.27. U.S. Nuclear Regulatory Commission, “General License for Custody and Long-Term Care of Residual Radioactive Material Disposal Sites,” *Code of Federal Regulations*.

40 CFR 192. U.S. Environmental Protection Agency, “Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings,” *Code of Federal Regulations*.

DOE (U.S. Department of Energy), 2008. *Long-Term Surveillance Plan for the Maybell, Colorado (UMTRCA Title I) Disposal Site, Moffat County, Colorado*, DOE-LM/1605-2008, Revision 4, April.

Janosko, G.S., 2005. Gary S. Janosko, chief of Fuel Cycle Facilities Branch, U.S. Nuclear Regulatory Commission, letter (about decommissioning of monitor wells at the Maybell, Colorado, Uranium Mill Tailings Radiation Control Act [UMTRCA] Title I Disposal Site) to Michael Tucker, site manager, U.S. Department of Energy, January 5.

## 11.10 Photographs

Photograph Location Number	Azimuth	Photograph Description
PL-1	115	Entrance Gate
PL-2	180	Entrance Sign
PL-3	0	Perimeter Fence Line
PL-4	265	Perimeter Sign P23
PL-5	—	Granite Site Marker SMK-1
PL-6	—	Boundary Monument BM-12
PL-7	290	Quality Control Monument QC-4
PL-8	40	Disposal Cell Top Slope and Southeastern Side Slope Interface
PL-9	280	Standing Water in Side Slope Apron
PL-10	100	Disposal Cell Eastern Side Slope and Cobble Blanket
PL-11	240	View Southwest of Diversion Channel No. 2
PL-12	300	Exposed Geofabric in Diversion Channel No. 1 Outlet
PL-13	310	Exposed Geofabric in Swale No. 1 Outlet
PL-14	210	Southwest View of Johnson Pit
PL-15	35	Sand Accumulation Along Southern Fence Line Near Johnson Pit

**Note:**

— = Photograph taken vertically from above.



*PL-1. Entrance Gate*



*PL-2. Entrance Sign*





*PL-3. Perimeter Fence Line*



*PL-4. Perimeter Sign P23*





*PL-5. Granite Site Marker SMK-1*



*PL-6. Boundary Monument BM-12*





*PL-7. Quality Control Monument QC-4*



*PL-8. Disposal Cell Top Slope and Southeastern Side Slope Interface*





*PL-9. Standing Water in Side Slope Apron*



*PL-10. Disposal Cell Eastern Side Slope and Cobble Blanket*





*PL-11. View Southwest of Diversion Channel No. 2*



*PL-12. Exposed Geofabric in Diversion Channel No. 1 Outlet*





*PL-13. Exposed Geofabric in Swale No. 1 Outlet*



*PL-14. Southwest View of Johnson Pit*





*PL-15. Sand Accumulation Along Southern Fence Line Near Johnson Pit*