

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 August 19, 2015. The disposal cell and all associated diversion and drainage structures were in good condition and functioning as designed. Noxious weeds found on the site and deep-rooted vegetation found on the disposal cell were sprayed with herbicide. Inspectors identified no other immediate maintenance needs or cause for a follow-up inspection.

11.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the *Long-Term Surveillance Plan for the Maybell, Colorado (UMTRCA Title I) Disposal Site, Moffat County, Colorado* (LTSP) (DOE-LM/1605-2008, U.S. Department of Energy [DOE], Revision 4, April 2008) 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). Table 11-1 lists these requirements.

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

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Sections 3.3 and 3.4	Section 11.4
Follow-Up Inspections	Section 3.5	Section 11.5
Maintenance	Section 3.6	Section 11.6
Emergency Measures	Section 3.6	Section 11.7
Environmental Monitoring	Section 3.7	Section 11.8

11.3 Institutional Controls

The 251-acre site (Figure 11-1) is owned by the United States of America and was accepted under the U.S. Nuclear Regulatory Commission general license at 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 consist of federal ownership of the property and the following physical features that are inspected annually: a perimeter fence and locked entrance gate, an entrance sign and perimeter warning signs, site markers, and boundary and survey monuments.

11.4 Inspection Results

The site, located about 25 miles west of Craig, Colorado, was inspected on August 19, 2015. The inspection was conducted by S. Hall and D. Traub of the DOE Legacy Management Support contractor. J. Nguyen (DOE Site Manager) and 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, 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.”

11.4.1 Site Surveillance Features

Figure 11-1 shows the locations of site surveillance features. Inspection results and recommended maintenance activities associated with site surveillance features are included in the following subsections. Photographs to support specific observations are identified in the text and in Figure 11-1 by photograph location (PL) numbers.

11.4.1.1 Site Access Road

Access to the site is via County Road 53, which runs north off U.S. Highway 40 approximately 8 miles east of Maybell, Colorado. The road has a gravel surface and was in good condition. County Road 53 ends at an unlocked gate near the northeast corner of the site (approximately 3 miles from U.S. Highway 40). The road continues west as a dirt two-track directly north of the site.

Because the access road to the Maybell site is a county road, Moffat County performs maintenance up to that point. From that point to the Maybell West site, DOE is responsible for road maintenance under a U.S. Bureau of Land Management (BLM) right-of-way permit. No road maintenance was necessary.

11.4.1.2 Gates and Perimeter Fence

Two gates are located in the perimeter fence along the north boundary of the site. One is considered the site entrance gate and is located adjacent to the site marker and entrance sign (PL-1). The second gate is located directly west of perimeter sign P3 in the northwest corner of the property. Both gates are standard tubular metal stock gates and were locked and in good condition.

A standard four-strand barbed-wire stock fence surrounds the disposal cell and drainage structures and much of the site, to facilitate land management by DOE. The site is located in wintering grounds frequented by big game animals (primarily pronghorn, deer, and elk) and is also surrounded by open range used to graze cattle (PL-2). As a result, minor damage to the perimeter fence occurs periodically. With the exception of broken top strands and damaged fence posts at two locations, the fence was in good condition. Repairs of the fence will be made when more significant repairs are needed; the fence remains functional.

11.4.1.3 Entrance Sign and Perimeter Signs

The entrance sign is located near the entrance gate and is mounted on a t-post in the fence line. It had a couple of bullet holes but remains legible (PL-1).

The site has 26 perimeter signs. On the north, west, and south sides of the site, perimeter signs are mounted on t-posts in the perimeter fence. On the east side of the site, perimeter signs are mounted on steel posts set in concrete and are located inside the property boundary approximately midway between the disposal cell and the perimeter fence. Several of the perimeter signs along the dirt road north and west of the site have bullet holes, but remain legible. The remaining signs were in good condition.

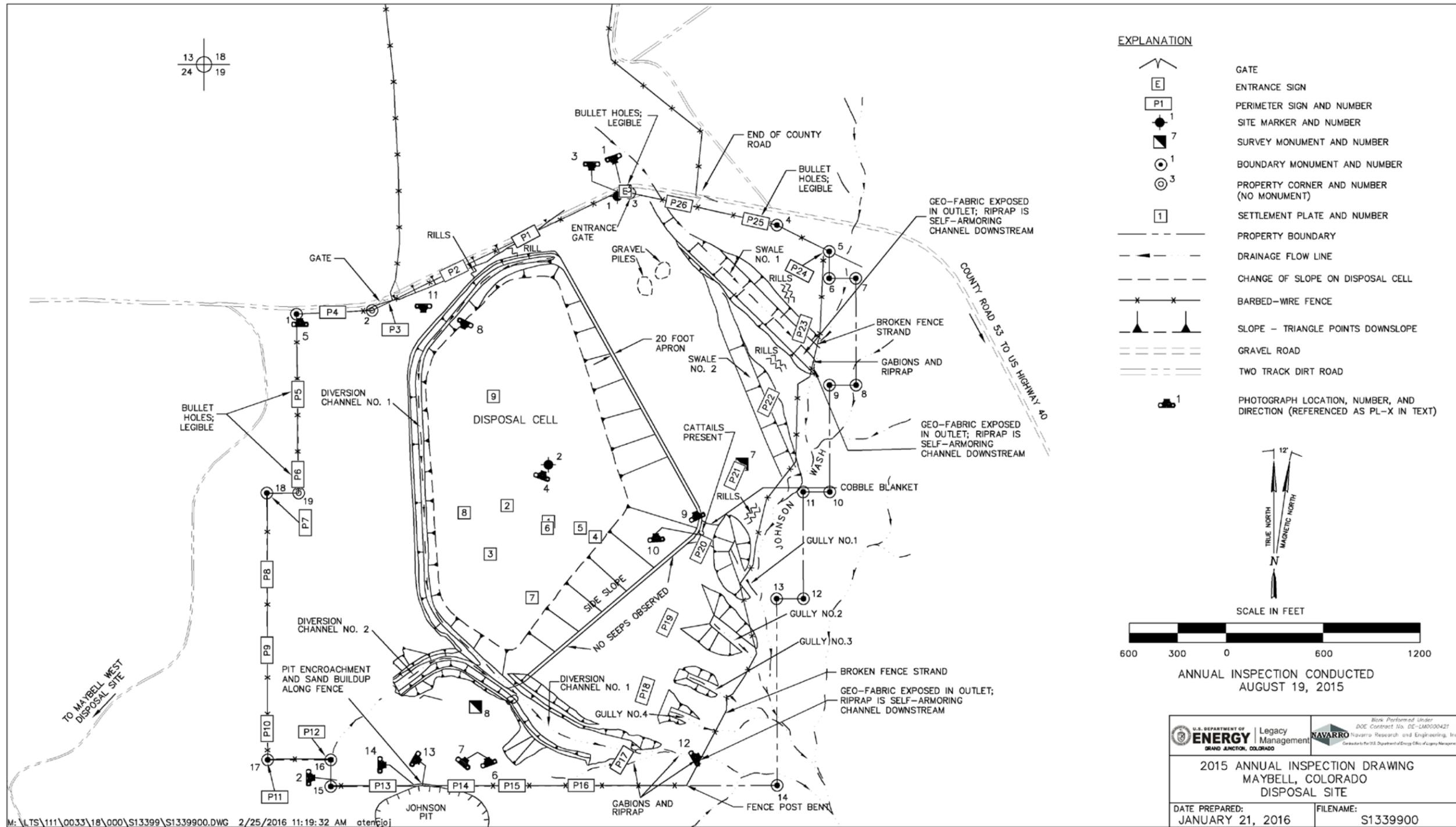


Figure 11-1. 2015 Annual Inspection Drawing for the Maybell Disposal Site

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11.4.1.4 Site Markers

Two standard granite site markers are at the site. Site marker SMK-1 is located near the entrance gate (PL-3), and site marker SMK-2 is located on top of the disposal cell (PL-4). Both site markers were in good condition.

11.4.1.5 Survey and Boundary Monuments

Two survey monuments are located onsite. 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. Survey monument SM-7 was inspected and observed to be in good condition; survey monument SM-8 was not inspected during the 2015 inspection.

Originally, four boundary monuments had been installed along the property boundary. These four monuments, however, did not adequately represent the site property boundary. Therefore, additional monuments were installed in September 2002. A 2008 real property assessment noted that the 2002 land survey did not match the legal description included in the BLM permanent withdrawal for the site. BLM confirmed that the perimeter fence along the north and northwest sides of the site corresponds to the actual site boundary and that nine of the new boundary monuments outside the fence in that area were located outside the property boundary. BLM recommended in 2014 that DOE leave those nine monuments in place undisturbed to avoid the cost of removing them. BLM and DOE documented the issue and recommendation in their records. Figure 11-1 shows the correct boundary monuments and property corners. All boundary monuments observed during the inspection were in good condition (PL-5).

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.

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

11.4.2.1 Disposal Cell

The disposal cell covers approximately 66 acres of the approximately 250-acre disposal site property (PL-6 and PL-7). The side slopes of the disposal cell are at a 20 percent grade to create a stable slope, and the top of the disposal cell has a 3 percent grade to promote drainage toward the west. The disposal cell showed no evidence of settlement, slumping, erosion, or rock degradation (PL-8 and PL-9). Scattered shallow-rooted plants continue to establish on the disposal cell top and side slopes; these plants do not affect the integrity of the disposal 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. Cattails continue to be observed growing at the toe of the east corner of the disposal cell, indicating the presence of moisture. Surface runoff from the cell discharges at this location; standing water has been observed in this area during past inspections and was present at the time of this inspection (PL-10). A 2003 laboratory analysis of evaporite minerals from this location confirmed that no constituents attributable to the cell contents were present.

11.4.2.2 Other Areas Inside the Site Boundary

The final surface conditions at the Maybell disposal 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, swales, and gullies were in good condition (PL-11). Erosion directly downgradient of the outlets of Diversion Channel No. 1 and Swale No. 1 that has exposed the underlying geo-fabric had not changed significantly (PL-12). Riprap placed within the outlets continues to provide protection against headcutting. Minor rills adjacent to Swale No. 1 and Gully No. 1 continue to stabilize due to self-armoring and increased vegetation growth. There was no evidence of sediment moving offsite into Johnson Wash.

11.4.2.3 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. No such impacts were observed.

Directly south of the site is a former open-pit uranium mine referred to as the Johnson Pit (PL-13). Over time, slumping of the pit wall resulted in the pit encroaching several feet onto what is now DOE property. This encroachment presents no threat to the integrity of the disposal cell and occurred prior to reclamation and transfer of the site to DOE for long-term surveillance and maintenance. This encroachment is visually monitored annually and periodically documented with photographs to determine if any further slumping of the pit wall is occurring and to verify the integrity of the perimeter fence. There was no evidence of any additional encroachment of the pit onto the site at the time of the inspection. However, windblown sand continues to accumulate along the northern crest of the pit wall along the fence line (PL-14); maintenance will be performed before the fence is no longer functional.

11.5 Follow-Up Inspections

DOE will conduct follow-up or contingency inspections if (1) an annual inspection or other site visit identifies a condition that requires a return to the site to evaluate the condition, or (2) a citizen or outside agency notifies DOE that conditions at the site or in the vicinity of the site are substantially changed. No need for a follow-up or contingency inspection was identified.

11.6 Maintenance

- 11A Noxious weeds and deep-rooted plants on the disposal cell were sprayed with herbicide during two separate vegetation management visits in 2015. Maintenance of the perimeter fence will be performed when warranted (i.e., repair of broken strands and bent posts, removal of sand directly

north of the Johnson Pit, and erosion damage at the outlet of Diversion Channel No. 1); the fence remains functional. No other maintenance needs were identified.

11.7 Emergency Measures

Emergency measures are the actions that DOE will take in response to “unusual damage or disruption” that threatens or compromises site safety, security, or integrity in compliance with 10 CFR 40, Appendix A, Criterion 12. No need for emergency measures was identified.

11.8 Environmental Monitoring

11.8.1 Groundwater Monitoring

- 11B Groundwater at this site is contaminated as a result of widespread, naturally occurring uranium mineralization and mining activities not related to onsite legacy uranium-ore processing and disposal operations. The groundwater in the area is designated “limited use,” a designation given to groundwater that is not a current or potential source of drinking water because it contains widespread ambient contamination that cannot be cleaned up by methods reasonably employed in public water systems (40 CFR 192.11[e][2]). Supplemental standards established in 40 CFR 192.21(g) have been applied to groundwater at the site, and groundwater quality monitoring is not required.

11.8.2 Vegetation Monitoring

In accordance with the LTSP, annual visual inspections are conducted to verify the continued health of the onsite vegetation and to ensure that undesirable plant species (deep-rooted plants on the disposal cell cover and noxious weeds) do not proliferate on the site. Some noxious weeds and deep-rooted plants were present on the cell during the inspection and were later treated with herbicide.

The disturbed soil surfaces on the site were revegetated with a mix of native and adaptive grasses to provide soil stability. Vegetation appeared to be healthy with continued increases in diversity and density.

11.9 Photographs

Photograph Location Number	Azimuth	Photograph Description
PL-1	160	Site entrance gate and sign; east corner of disposal cell in background.
PL-2	90	View east from southwest corner of site showing cattle grazing outside the perimeter fence.
PL-3	180	Site marker SMK-1.
PL-4	20	Site marker SMK-2.
PL-5	NA	Boundary monument BM-1.
PL-6	340	Southwestern portion of disposal cell.
PL-7	40	Southeastern portion of disposal cell.
PL-8	205	Northwest corner of disposal cell, view to south-southwest; riprap-covered slope west of cell in background.
PL-9	335	East-northeast side slope of disposal cell.
PL-10	355	Cattails growing at base of southeast side slope of disposal cell where surface water runoff accumulates.
PL-11	180	Diversion Channel No. 1 separating disposal cell and riprap covered slope west of cell.
PL-12	60	Erosion occurring at the outlet to Diversion Channel No. 1.
PL-13	120	Northeast portion of Johnson Pit.
PL-14	90	Sand accumulation covering perimeter fence along southern property boundary directly north of Johnson Pit.



MAY 8/2015. PL-1. Site entrance gate and sign; east corner of disposal cell in background.



MAY 8/2015. PL-2. View east from southwest corner of site showing cattle grazing outside the perimeter fence.



MAY 8/2015. PL-3. Site marker SMK-1.



MAY 8/2015. PL-4. Site marker SMK-2.



MAY 8/2015. PL-5. Boundary monument BM-1.



MAY 8/2015. PL-6. Southwestern portion of disposal cell.



MAY 8/2015. PL-7. Southeastern portion of disposal cell.



MAY 8/2015. PL-8. Northwest corner of disposal cell, view to south southwest; riprap-covered slope west of cell in background.



MAY 8/2015. PL-9. East-northeast side slope of disposal cell.



MAY 8/2015. PL-10. Cattails growing at base of southeast side slope of disposal cell where surface water runoff accumulates.



MAY 8/2015. PL-11. Diversion Channel No. 1 separating disposal cell and riprap covered slope west of cell.



MAY 8/2015. PL-12. Erosion occurring at the outlet to Diversion Channel No. 1.



MAY 8/2015. PL-13. Northeast portion of Johnson Pit.



MAY 8/2015. PL-14. Sand accumulation covering perimeter fence along southern property boundary directly north of Johnson Pit.

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