

8.0 Gunnison, Colorado, Disposal Site

8.1 Compliance Summary

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) conducted the Gunnison, Colorado, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Disposal Site (site) inspection on September 15, 2020. No cause for a follow-up inspection was identified.

No changes were observed on the disposal cell or in the associated diversion channels. Inspectors identified several minor maintenance needs and addressed most during the site inspection.

The most recent sampling event occurred in July 2016. The next scheduled monitoring event will occur in 2021. Groundwater monitoring results were below the site-specific uranium action level in all point-of-compliance (POC) wells.

8.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the site are specified in the site-specific Long-Term Surveillance Plan (LTSP) (DOE 1997) in accordance with procedures established to comply with the requirements of the U.S. Nuclear Regulatory Commission general license at Title 10 *Code of Federal Regulations* Section 40.27 (10 CFR 40.27). Table 8-1 lists these requirements.

Table 8-1. License Requirements for the Gunnison, Colorado, Disposal Site

Requirement	LTSP	This Report	10 CFR 40.27
Annual Inspection and Report	Section 3.0	Section 8.4	(b)(3)
Follow-Up Inspections	Section 3.5	Section 8.5	(b)(4)
Maintenance and Repairs	Section 5.0	Section 8.6	(b)(5)
Groundwater Monitoring	Section 4.0	Section 8.7	(b)(2)
Corrective Action	Section 6.0	Section 8.8	--

8.3 Institutional Controls

The 92-acre site, identified by the property boundary shown in Figure 8-1 is owned by the United States and was accepted under the general license in 1997. 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 (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 diversion channel, entrance gate, and sign; perimeter fence and signs; site markers, survey and boundary monuments, and wellhead protectors.

8.4 Inspection Results

The site, 6 miles southeast of Gunnison, Colorado, was inspected on September 15, 2020. The inspection was conducted by M. Kastens and D. Holbrook of the Legacy Management Support

contractor. J. Dayvault (LM 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, identify changes in conditions that might affect conformance with the LTSP, and evaluate the need, if any, for maintenance or additional inspection and monitoring. The results of the inspection are reported in the remainder of Section 8.4.

8.4.1 Site Surveillance Features

Figure 8-1 shows the locations of site features in black and gray font, including site surveillance features and inspection areas. 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 2020 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 8-1 by photograph location (PL) numbers. The photographs and photograph log are presented in Section 8.10.

8.4.1.1 Site Access, Entrance Gate, and Entrance Sign

Access to the site is from Gunnison County Road 42 onto U.S. Bureau of Land Management (BLM) Route 3068, a gravel road maintained by BLM. Entrance to the site is through a locked gate that is part of the perimeter fence. The entrance gate was locked and functional. The entrance sign (PL-1) is bolted to a perimeter fence post next to the entrance gate. The entrance sign has bullet damage but remains legible. The front entrance sign will be replaced at the time of the next scheduled site maintenance activity. No other maintenance needs were identified.

8.4.1.2 Perimeter Fence and Signs

A three-strand barbed-wire perimeter fence encloses the site; most of it is set along the property boundary. In 2019, fence flagging (PL-2 and PL-3) was added as a mechanism for protecting sage grouse and antelope that occupy the area. The perimeter fence was intact. No other maintenance needs were identified.

Two barbed-wire gates—one on the east fence line and the other on the north fence line—provide egress from the site to offsite monitoring wells; both gates were locked.

There are 45 perimeter signs bolted to the perimeter fence posts. Several perimeter signs have bullet damage but remain legible. In 2020, perimeter signs P4–P13 along the west perimeter fence were replaced. Perimeter signs P36, P37 (PL-4), P38, and P41 are constructed of plastic and are faded and curling. The plastic signs have been rescheduled for replacement with metal signs in 2021. All new signs will include the words “Gunnison Site.” Other perimeter signs that are damaged and showing wear will be replaced over the next 2 years. No other maintenance needs were identified.

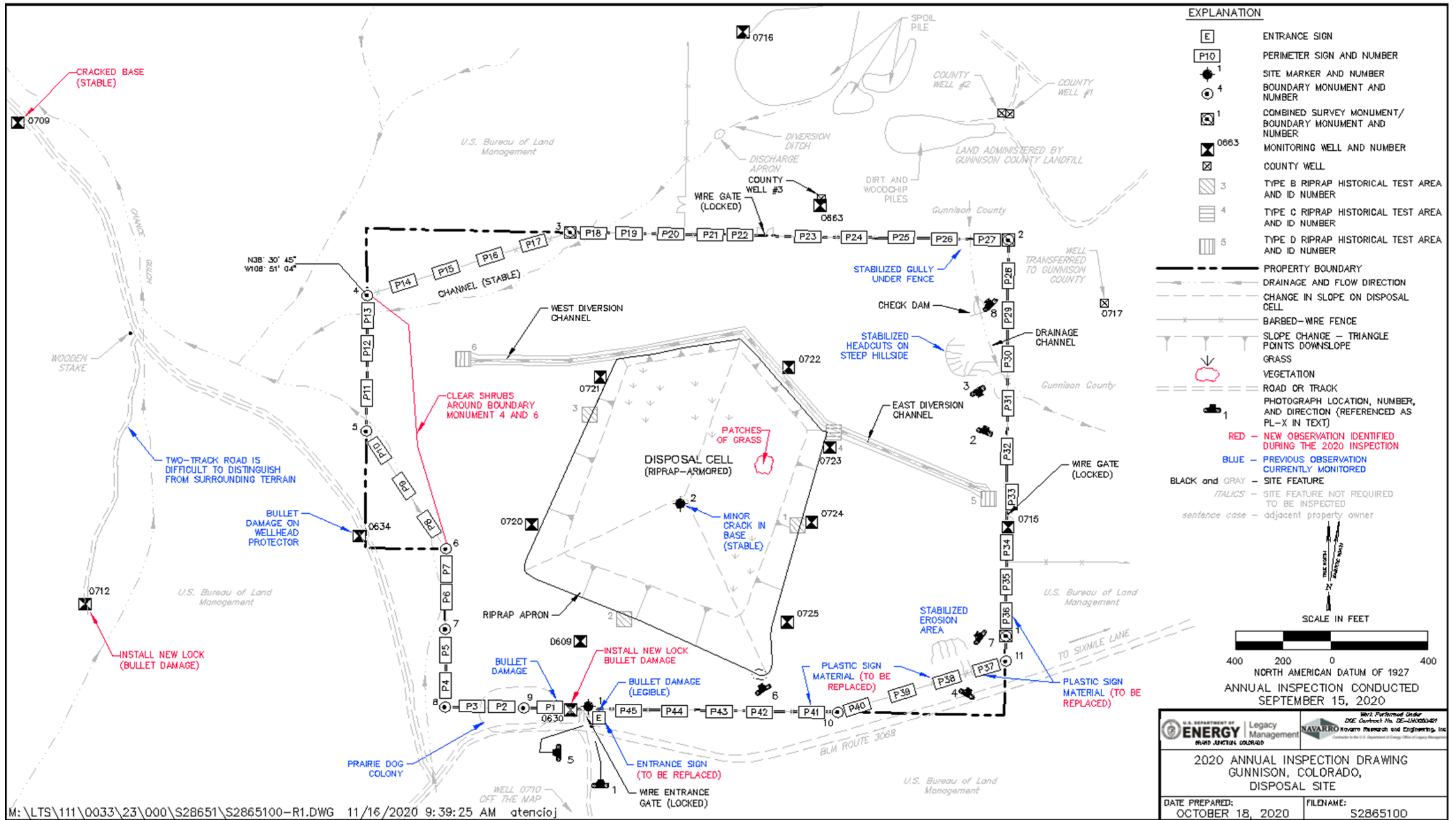


Figure 8-1. 2020 Annual Inspection Drawing for the Gunnison, Colorado, Disposal Site

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8.4.1.3 Site Markers

The site has two granite site markers. Site marker SMK-1 is just inside the entrance gate, and site marker SMK-2 is on the top slope of the disposal cell. The base of site marker SMK-2 has a small, insignificant crack and remains stable. No maintenance needs were identified.

8.4.1.4 Survey and Boundary Monuments

Three combined survey and boundary monuments and eight additional boundary monuments delineate the property boundary. No maintenance needs were identified.

8.4.1.5 Monitoring Wells

The site has 16 groundwater monitoring wells. The wellhead protectors were locked and properly labeled. Bullet damage is present on the locks of monitoring wells 0630 (PL-5) and 0712 and on the wellhead protector of monitoring well 0634. Both wells are secure, though new locks will be installed on both monitoring wells. Gunnison County landfill operators have placed concrete barriers to protect monitoring well 0716, which is on landfill property, from landfill activities. The edge of an adjacent spoil pile, although close to the concrete barriers, does not impair access to monitoring well 0716. The base of monitoring well 0709 is cracked but remains stable. Inspectors will continue to monitor these features. No maintenance needs were identified.

8.4.2 Inspection Areas

In accordance with the LTSP, the site is divided into four inspection areas to ensure a thorough and efficient inspection. The inspection areas are (1) the top of the disposal cell; (2) the disposal cell side slopes, apron, and diversion channels; (3) the area between the disposal cell and the site boundary; and (4) the outlying area. Inspectors examined 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.

8.4.2.1 Top of the Disposal Cell

The disposal cell, completed in 1995, occupies 29 acres and is armored with basalt riprap to control erosion. There was no evidence of settling, slumping, erosion, or any other modifying process that might affect the integrity of the top slope of the disposal cell. Several isolated patches of grass have established on the top slope; however, these shallow-rooted plants do not degrade the performance of the radon barrier component of the disposal cell's engineered cover. No maintenance needs were identified.

8.4.2.2 Disposal Cell Side Slopes, Apron, and Diversion Channels

Basalt riprap armors the disposal cell side slopes, an apron to collect and divert stormwater runoff from the disposal cell, and two diversion channels to protect the disposal cell from precipitation run-on. There was no evidence of settling, slumping, erosion, or any other modifying process that might affect the integrity of the disposal cell side slopes, apron, or diversion channels. Six rock-monitoring test areas were last inspected during the 2017 annual

inspection; monitoring is no longer required in accordance with the LTSP because no rock degradation had been observed.

Stormwater runoff from the disposal cell occasionally ponds in a low-lying area at the southeast corner of the disposal cell; standing water was present at the time of the inspection (PL-6). The riparian-type vegetation that has become established there indicates that the area retains moisture. Water collection in this area does not pose a problem because the disposal cell surfaces are designed to drain to the southeast, and any water that ponds there is below the elevation of tailings placed under the engineered cover. No maintenance needs were identified.

8.4.2.3 Area Between the Disposal Cell and the Site Boundary

Reclaimed and undisturbed areas comprise the area between the disposal cell and the site boundary (PL-7). In general, the vegetation in the reseeded, reclaimed areas consists of well-established grass; native plants are much less abundant and less diverse in reclaimed areas than they are in undisturbed areas. Former erosion areas continue to be stable and are naturally revegetating with native plant species. No maintenance needs were identified.

8.4.2.4 Outlying Area

In accordance with the LTSP, a drainage feature from the southeast corner of the site and along BLM Route 3068 was checked for indications of seepage from the vadose zone. The feature, which follows the borrow ditch along the road, was dry and showed no signs of seepage.

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. Gunnison County owns the land that adjoins the site boundary to the north and east and uses the land for a municipal landfill. The nearest landfill operations continue to be approximately 400 feet north of the site (PL-8). Although landfill activities do not affect the site, inspectors will continue to monitor the level of activity occurring near the site boundary and surveillance features (e.g., fences and monitoring wells). With regard to groundwater flow, the landfill operations are upgradient from the disposal cell. The proximity of the spoil pile to monitoring well 0716 (see Figure 8-1) is the only current concern for activities that could affect a site asset. Inspectors will continue to monitor this area.

8.5 Follow-Up or Contingency 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.

8.6 Maintenance and Repairs

In 2020, perimeter signs P4–P13 along the west perimeter fence were replaced.

Below is a summary of scheduled Gunnison site maintenance activities that will be completed in the future:

- Installation of new front entrance sign with current contact information
- Replacement of plastic perimeter signs P36, P37, P38, and P41
- Installation of new locks on wells 0630 and 0712
- Clearing of shrubs around boundary monuments BM-4 and BM-6

No other maintenance needs were identified.

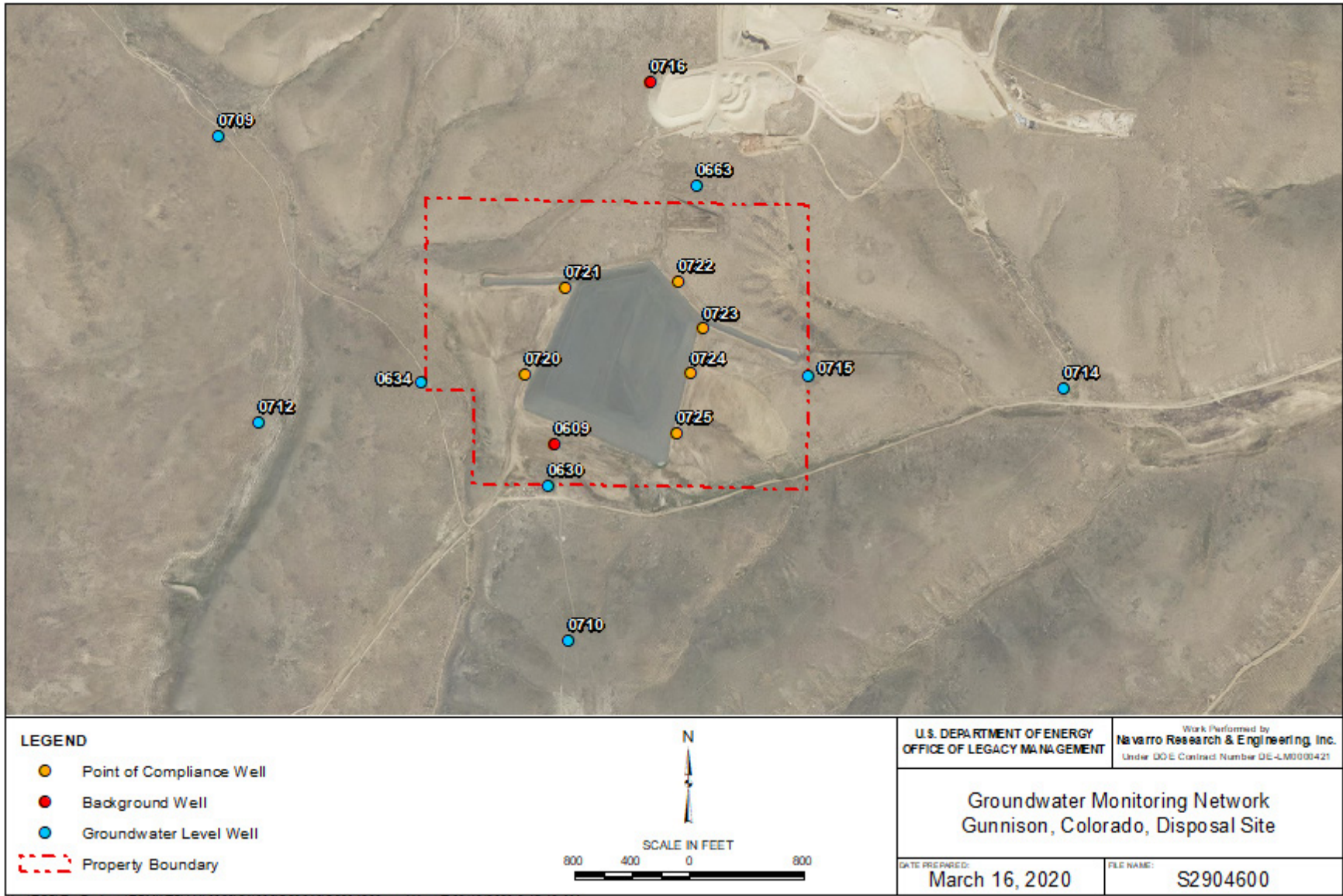
8.7 Groundwater Monitoring

In accordance with the LTSP, LM conducts groundwater monitoring every 5 years to demonstrate that the site-specific uranium action level has not been exceeded. Groundwater was sampled and groundwater levels were measured annually from 1998 through 2001. Following the 2001 sampling event, the monitoring frequency changed to once every 5 years. The most recent sampling event occurred in July 2016. The next event is scheduled to occur in 2021.

The groundwater monitoring network consists of 16 monitoring wells. That total includes six POC wells, two monitoring wells to monitor background groundwater quality, and eight wells to monitor groundwater levels (Table 8-2 and Figure 8-2). The indicator analyte for disposal cell performance is uranium, which was selected because of its presence in tailings pore fluid, its relatively high mobility in groundwater, and its low concentration in upgradient (background) groundwater. The site-specific screening monitoring action level (action level) concentration for uranium is 0.013 milligram per liter (mg/L). The basis for this action level is the maximum observed concentration of uranium in background samples before long-term surveillance and maintenance activities began. The U.S. Environmental Protection Agency established a maximum concentration limit for uranium of 0.044 mg/L in groundwater (40 CFR 192 Subpart A Table 1).

Table 8-2. Groundwater Monitoring Network for the Gunnison, Colorado, Disposal Site

POC and Background Wells	Groundwater Level Wells
0720 (POC)	0630
0721 (POC)	0634
0722 (POC)	0663
0723 (POC)	0709
0724 (POC)	0710
0725 (POC)	0712
0609 (background)	0714
0716 (background)	0715



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Figure 8-2. Groundwater Monitoring Network at the Gunnison, Colorado, Disposal Site

All groundwater monitoring results for the site are reported and published on the LM Geospatial Environmental Mapping System (GEMS) website (<https://gems.lm.doe.gov/#site=GUD>). The *2016 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title I Disposal Sites* (DOE 2017) shows the most recent monitoring results. The report shows uranium concentration was below the action level (0.013 mg/L) in all POC wells and indicates continued groundwater compliance at the Gunnison disposal site.

8.8 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 192.04. No need for corrective action was identified.

8.9 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 Subpart A Table 1. U.S. Environmental Protection Agency, “Maximum Concentration of Constituents for Groundwater Protection,” *Code of Federal Regulations*.

40 CFR 192.04. U.S. Environmental Protection Agency, “Corrective Action,” *Code of Federal Regulations*.

DOE (U.S. Department of Energy), 1997. *Long-Term Surveillance Plan for the Gunnison, Colorado, Disposal Site*, DOE/AL/62350-222, Rev. 2, April.

DOE (U.S. Department of Energy), 2017. *2016 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title I Disposal Sites*, LMS/S15036, Office of Legacy Management, March.

8.10 Photographs

Photograph Location Number	Azimuth	Photograph Description
PL-1	0	Entrance Sign
PL-2	20	Fence Flagging on East Fence Line
PL-3	150	Fence Flagging on East Fence Line
PL-4	30	Perimeter Sign P37
PL-5	270	Well 0630
PL-6	330	Water in Cell Apron, Southeast Corner
PL-7	310	Reclaimed Area East of Cell
PL-8	320	Gunnison County Landfill Operations



PL-1. Entrance Sign



PL-2. Fence Flagging on East Fence Line



PL-3. Fence Flagging on East Fence Line



PL-4. Perimeter Sign P37



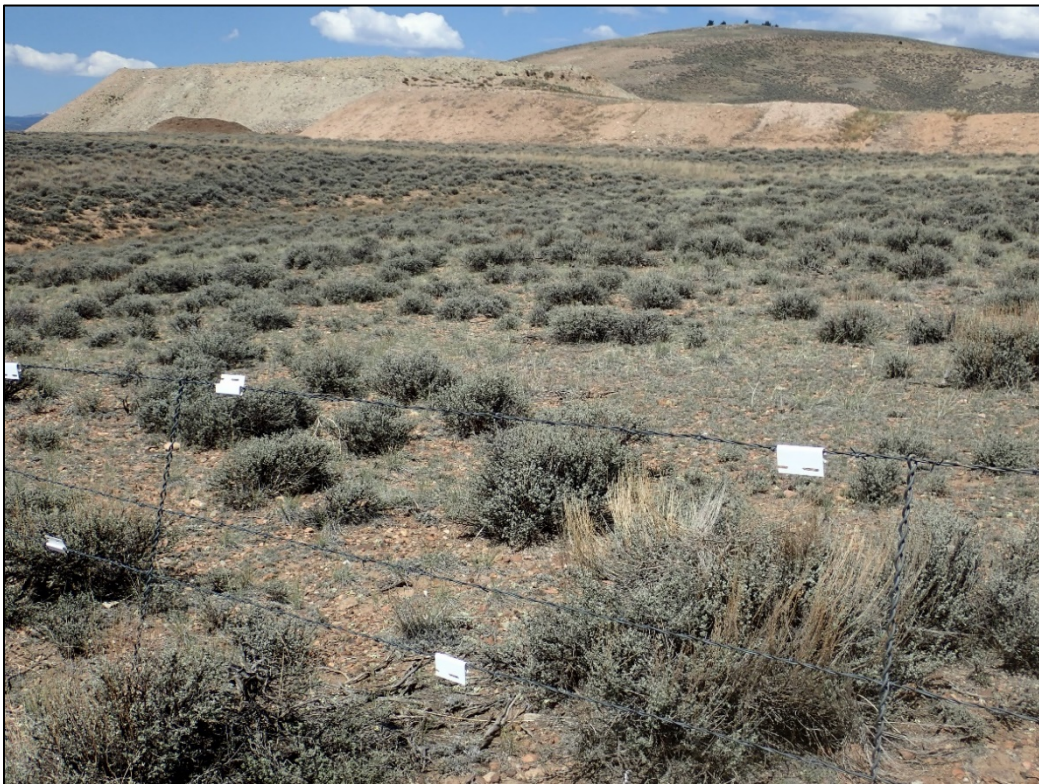
PL-5. Well 0630



PL-6. Water in Cell Apron, Southeast Corner



PL-7. Reclaimed Area East of Cell



PL-8. Gunnison County Landfill Operations

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