




**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION IV  
1600 EAST LAMAR BOULEVARD  
ARLINGTON, TEXAS 76011-4511

June 11, 2024

MEMORANDUM TO: Docket File WM-00043

THROUGH: Gregory G. Warnick, Chief  Signed by Warnick, Gregory  
Decommissioning, ISFSI, and Operating Reactor Branch on 06/11/24  
Division of Radiological Safety and Security

FROM: Robert J. Evans, PhD, Senior Health Physicist  
Decommissioning, ISFSI, and Operating Reactor Branch  
Division of Radiological Safety and Security

SUBJECT: OBSERVATIONAL SITE VISIT AT LOWMAN DISPOSAL SITE

On May 14, 2024, the U.S. Nuclear Regulatory Commission (NRC) conducted an observational site visit at the U.S. Department of Energy's (DOE's) Lowman Disposal Site in Boise County, Idaho. This site visit was conducted in accordance with the guidance provided in NRC Inspection Procedure 89060, "Department of Energy Observational Site Visits." The NRC inspectors observed DOE's routine, annual inspection of the Lowman Disposal Site. Enclosed to this memorandum is the NRC's report for this site visit.

The objectives of the site visit were to verify that DOE: (1) complied with the general license requirements specified in Title 10 to the *Code of Federal Regulations* (10 CFR) 40.27, "General License for Care and Long-term Custody of Residual Radioactive Material Disposal Sites;" and (2) effectively managed the disposal site in a manner that was protective of public health, safety, and the environment. In summary, DOE representatives conducted the annual inspection in accordance with the requirements specified in the NRC-accepted Long-Term Surveillance Plan dated January 2005. The disposal cell and surrounding apron appeared to be in excellent condition. No significant regulatory issues or safety concerns were identified during the site visit.

Docket No. WM-00043  
General license pursuant to 10 CFR 40.27

Enclosure:  
NRC Report

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817-200-1234

## OBSERVATIONAL SITE VISIT AT LOWMAN DISPOSAL SITE - DATED JUNE 11, 2024

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DOCUMENT NAME: OBSERVATIONAL SITE VISIT AT LOWMAN DISPOSAL SITE

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**U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV**

Docket No.	WM-00043
License No.	General license pursuant to 10 CFR 40.27
Report No.	WM-00043/2024-001
Licensee:	U.S. Department of Energy
Facility:	Lowman Disposal Cell
Location:	Boise County, Idaho
Date:	May 14, 2024
Inspectors:	Robert J. Evans, PE, CHP, PhD, Senior Health Physicist Decommissioning, ISFSI, and Operating Reactor Branch Division of Radiological Safety and Security  Eric S. McManus, Health Physicist Decommissioning, ISFSI, and Operating Reactor Branch Division of Radiological Safety and Security
Approved By:	Gregory G. Warnick, Chief Decommissioning, ISFSI, and Operating Reactor Branch Division of Radiological Safety and Security
Attachment:	Photographs taken at the Lowman Disposal Site

Enclosure

## NRC Report

### 1 Background

Porter Brothers Corporation operated the Lowman mill from 1955-1960. The mill recovered rare-earth elements from sands excavated from the Bear Valley site located north of the mill. The sands were processed using a mechanical-separation process instead of chemical separation. Approximately 200,000 tons of concentrates were produced. The waste product consisted of sands containing uranium, radium, and thorium. The mill was closed in 1960, and the site was abandoned.

The U.S. Department of Energy (DOE) decommissioned the site from 1991-1992. The amount of material disposed was estimated to be about 222,230 dry tons with a total activity of 12 curies of radium-226. The disposed materials included the radioactive sands, construction debris, contaminated soil, and vicinity property material.

The disposal cell is classified as at Title I site under the Uranium Mill Tailings Radiation Control Act of 1978. The DOE maintains long-term custody of the site under the U.S. Nuclear Regulatory Commission's (NRC) general license requirements specified in Title 10 to the *Code of Federal Regulations* (10 CFR) 40.27.

The long-term surveillance plan (LTSP) specifies how DOE will fulfill the general license requirements specified in 10 CFR 40.27. The original LTSP (revision 1) was accepted by the NRC in September 1994 (Agencywide Documents Access and Management System [ADAMS] Accession No. ML051250281). An updated LTSP (revision 2) was accepted by the NRC in April 2005 (ML050960279).

### 2 Site Status

The disposal site is located about a half-mile east of Lowman, Idaho. The disposal cell occupies approximately 8.3 acres of the 18.1-acre property. The disposal cell is a surface impoundment where the bottom of the cell is the original ground surface. The disposed material is about 20-feet thick at the center of the cell. Since the sands were mechanically processed, a liner was not required to be installed between the sands and the ground surface. The cover consists of an 18-inch radon barrier, 6-inch sand layer, and 12-inch riprap erosion protection layer.

An apron consisting of coarse riprap surrounds the disposal cell base for erosion protection and for diversion of rainwater. The apron ranges from 3-6 feet thick and is 30-35 feet wide. In 1997, DOE constructed a collection ditch and three drainage terraces, also known as interceptor benches, to the north of the disposal cell. The ditch and terraces were designed to intercept rainwater runoff and divert it away from the site.

The LTSP provides the procedures for inspecting the site as well as features that are unique to the Lowman disposal site. The LTSP requires the site to be inspected annually and provides the procedures for the inspection. The site-specific features that are checked as part of each inspection include four boundary monuments, three combined survey-boundary monuments, two site markers (Figure 1), 18 perimeter signs (Figure 2), one entrance sign, and one small perennial spring located to the southwest of the site. In addition to the top and side slopes of the disposal cell, the LTSP requires DOE to

inspect the area between the disposal cell and the site boundary, and the outlying areas up to a quarter mile around the site.

The LTSP describes DOE's strategy for vegetation growth on top and near the disposal cell. The LTSP states that DOE will allow the progressive establishment of the native plant community on the cover of the cell. However, in response to an Idaho Department of Environmental Quality inquiry around 2010, DOE decided that it would control the growth of conifers, including the ponderosa pine trees, on the disposal cell as a best management practice. The DOE implemented this change from the LTSP since high winds could uproot conifers and damage the surface of the disposal cell. Since about 2010, DOE continued to implement a program to control conifers on an as-needed basis.

In 2020, three aerial survey quality control monuments were installed for future aerial surveys of the site. No baseline aerial survey has been performed by DOE since the monuments were installed.

The last DOE inspection of the Lowman disposal site occurred on June 6, 2023. The DOE inspectors identified minor maintenance needs that were completed during the inspection but did not identify any maintenance items that required a follow-up visit.

### **3 Site Observations and Findings (IP 89060)**

#### **3.1 Observation of Site Activities (Risk Module RM-01)**

The purposes of the DOE inspection were to confirm the integrity of the visible features of the site, identify changes in conditions that might affect conformance with the LTSP, and evaluate whether maintenance or follow up inspection or monitoring is required. Details for the site inspection are provided in Section 3 of the LTSP. The DOE site managers and contractors for DOE developed a site-specific checklist based on the LTSP to confirm compliance with both site-specific features and general inspection requirements.

The NRC inspectors noted that the disposal cell and the apron around the cell appeared to be in excellent condition (Figures 3 and 4). Some minor erosion was observed to the north of the disposal cell, but the erosion had no impact on the disposal cell itself. Some non-native, invasive weeds were identified by Boise County, Idaho, staff, who planned to spray the weeds with an herbicide in the next few days. One small conifer was identified for removal within the disposal cell footprint under DOE's best management practice for control of conifers on or near the disposal cell. One perimeter sign was found to be damaged and was replaced during the site inspection. No significant safety or maintenance issues were identified during the DOE inspection of the disposal cell property.

Although not required by the LTSP, DOE staff are considering the development of a site-specific fire mitigation plan, in part, because the site is located in a forested area. At the time of the site inspection, DOE had not made a final decision about the details to be provided in the proposed plan.

The NRC inspectors conducted independent radiological surveys using a Ludlum Model 2401-S survey meter (serial number 181513, calibration due date of 3/28/25) and a Thermo Scientific Radeye G survey meter (serial number 30932, calibration due date of

1/19/25). With background levels around 18-20 microRem/hour ( $\mu\text{R/hr}$ ), most of the site measured around background levels. A few areas to the southwest and east of the disposal cell were found to be elevated due to previous operations involving radioactive sands. The highest measurement, about 270  $\mu\text{R/hr}$ , was identified in a drainage pathway off the old haul road in the southwestern corner of the site. The areas with exposure rates above background were limited in size and were not easily accessible to members of the public.

### 3.2 Public Doses, Effluent Release, and Environmental Monitoring (Risk Module RM-02)

The NRC inspectors reviewed the LTSP requirements for groundwater monitoring. Between 1994-2004, DOE conducted groundwater monitoring to confirm that the groundwater had not been contaminated by previous site activities. Antimony was selected as the target analyte to demonstrate compliance with the U.S. Environmental Protection Agency drinking water standards. Because the concentrations of antimony in groundwater were less than the maximum background concentration, DOE elected to discontinue groundwater monitoring in 2004. The NRC concurred with DOE's decision, and the LTSP was reissued in 2005, removing the groundwater sampling program. The four monitoring wells were subsequently decommissioned in 2006.

## 4 **Conclusions**

The NRC inspectors concluded that the DOE inspectors conducted the site inspection in accordance with the instructions provided in the site checklist, LTSP, and 10 CFR 40.27 requirements. The disposal cell appeared to be in excellent condition with no erosion or slumping on the cell. Minor erosion was noted north of the cell, but the erosion had no impact on the cell itself. Elevated radioactivity measurements from previous operations were observed in selected locations around the 18-acre property, but the areas were limited in size and not easily accessible.

## 5 **Meeting Summary**

The NRC inspectors participated in a pre-planning meeting with the DOE site managers and other DOE representatives prior to the site inspection. During this meeting, topics such as site status, inspection plan, potential site hazards, and emergency plan were discussed. At the conclusion of the site inspection, the NRC inspectors discussed their final site observations with DOE staff.

## 6 **Persons Contacted**

Z. Aldous, Site Lead, RSI EnTech, LLC  
W. Frazier, Site Manager, DOE Office of Legacy Management  
M. Guziak, Site Lead, RSI EnTech, LLC  
K. Kreie, Site Manager, DOE Office of Legacy Management  
K. McGee, Superintendent, Boise County, Idaho  
D. Nygard, Remediation Program Manager, Idaho Department of Environmental Quality  
P. Rekow, Superintendent, Boise County, Idaho

Photographs taken at the Lowman Disposal Site



Figure 1: Site marker on top of disposal cell



Figure 2: Typical perimeter sign



Figure 3: Disposal cell with apron riprap in foreground (looking north to south)



Figure 4: Disposal cell with apron in foreground (looking east to west)