



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

June 28, 2019

MEMORANDUM TO: Docket File WM-00086

THROUGH: Heather J. Gepford, PhD, CHP, Chief /RA/
Materials Licensing and Decommissioning Branch
Division of Nuclear Materials Safety

FROM: Austin Roberts, Health Physicist
Materials Licensing and Decommissioning Branch
Division of Nuclear Materials Safety

SUBJECT: NRC OBSERVATIONAL SITE VISIT AT THE SLICK ROCK,
COLORADO DISPOSAL SITE

The U.S. Nuclear Regulatory Commission (NRC), Region IV Office, conducted an observational site visit on May 29, 2019, at the U.S. Department of Energy's (DOE) Slick Rock Disposal Site in San Miguel County, Colorado. This observational site visit was conducted in accordance with the NRC's guidance dated September 7, 2012 (ML12213A418). The purpose of the site visit was to observe the DOE's routine, annual inspection of the facility. Enclosed to this memorandum is the NRC's report for this observational site visit.

In summary, the DOE's representatives conducted the work in accordance with the instructions provided in the Long-Term Surveillance Plan dated May 1998. No significant regulatory issues or safety concerns were identified during the site visit.

Docket: WM-00086
License: General License Pursuant to 10 CFR 40.27

Enclosure:
NRC Report WM-00086/2019-001

cc: J. Nguyen, DOE
M. Cosby, State of Colorado

CONTACT: Austin Roberts, DNMS/MLDB
817-200-1209

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

Docket: WM-00086

License: General License Pursuant to 10 CFR 40.27

Report: WM-00086/2019-001

Licensee: U.S. Department of Energy

Facility: Slick Rock Disposal Site

Location: San Miguel County, Colorado

Date: May 29, 2019

Inspectors: Linda Gersey, CHP, Health Physicist
Materials Inspection Branch
Division of Nuclear Materials Safety

Austin Roberts, Health Physicist (inspector in training)
Materials Licensing and Decommissioning Branch
Division of Nuclear Materials Safety

Approved by: Heather J. Gepford, PhD, CHP, Chief
Materials Licensing and Decommissioning Branch
Division of Nuclear Materials Safety

Attachment: Photographs taken at the Slick Rock Disposal Site

Enclosure

NRC Trip Report

1 Background

The Slick Rock Disposal Cell, also known as the Burro Canyon Disposal Cell, was constructed for disposal of wastes from two former mills located on the Dolores River near Slick Rock, Colorado. The North Continent mill operated from 1931 until the early 1960s, while the Union Carbide mill operated from 1957-1961.

In 1995-1996, the U.S. Department of Energy (DOE) relocated uranium mill tailings and residual radioactive material from the two sites and placed them in the Slick Rock Disposal Cell. Approximately 134,300 cubic yards of material was relocated from the North Continent mill site, and approximately 671,000 cubic yards of material was relocated from the Union Carbide mill site.

The DOE completed the construction of the disposal cell in December 1996. The cell is approximately 630 feet by 900 feet at the base, and the cell occupies an area of approximately 12 acres. The cell is situated on a 62-acre site that is managed by the DOE. The cell contains approximately 1.1 million dry tons of tailings and waste material.

The cell was constructed at an angle into the ground surface. The depth of the cell ranges from 7-20 feet below ground surface. The material was placed into the excavated area and covered with a radon barrier, frost protection layer, bedding layer, and erosion protection layer. The top of the cell is approximately 50-feet above ground surface. A rip-rap apron surrounds the perimeter of the disposal cell for erosion protection and to channel rainwater away from the cell. The disturbed areas around the cell were regraded and seeded with native grasses. A retention pond was constructed downgradient of the cell, for collection of rainwater.

The DOE submitted the "Long-term Surveillance Plan for the Burro Canyon Disposal Cell" to the NRC in 1998. The long-term surveillance plan (LTSP) provides instructions for institutional control of the site. These controls include deed restrictions, site markers, survey monuments, boundary markers, gates, fences, and signs. The LTSP does not require groundwater monitoring at this site, because the uppermost aquifer is not a current or potential source of drinking water based on the low yield of the uppermost aquifer. The DOE maintains institutional control of the site under the provisions of 10 CFR 40.27.

The LTSP previously provided instructions for the DOE to conduct water level monitoring for an interim period of time. The DOE monitored the water level within the cell using standpipes. By letter dated June 29, 2001, the DOE requested the NRC approval to terminate water level monitoring. The NRC approved the DOE's request in February 2002. The standpipes have since been filled with bentonite, but the standpipes continue to remain in place at the disposal cell.

2 Site Status

The last annual DOE inspection of the Slick Rock Disposal Site was conducted in May 2018. The inspection found no evidence of settling, slumping, or erosion on any of the rock-covered surfaces. Erosional rills and gullies were observed within the site boundary but away from the disposal cell. The most significant rills and erosional features were observed in the area between the disposal cell and the retention pond. The DOE staff concluded that these erosional features were stabilizing, due to rocks and beneficial vegetation, and posed no hazard to the disposal cell. In summary, the DOE staff did not identify any significant maintenance or contingency items during the 2018 inspection.

3 Site Observations and Findings

To conduct the site inspection, the DOE and its contractors created an inspection checklist. The checklist included requirements for the inspectors to observe the disposal cell, site perimeter, outlying areas, vegetation, and various site-specific features. The inspection staff included the DOE site manager and two contractors. The contractors had experience in project management, ecology, and geology. The DOE inspectors were accompanied by a representative from the State of Colorado.

The DOE inspectors checked the disposal cell for evidence of erosion, settlement, slumping, displacement, and any other feature that required maintenance or repair. The rock surfaces on the cover and side slopes were found to be in excellent condition (Figures 1 and 2). The DOE inspectors identified one low area in the southwestern apron. This low area was characterized as 40-50 feet long, 2-3 feet wide, and several inches deep. The DOE staff noted this low area on the site map and planned to observe the status of this area over time.

The rills and erosion gullies observed during the 2018 inspection were still visible (Figure 3). The DOE staff concluded that the erosion had not changed significantly since the previous inspection. In summary, the DOE staff did not consider the erosion to be significant, and the erosion had no observable impact on the disposal cell itself. The DOE staff did not believe that repairs were necessary at this time, but the DOE staff will continue to monitor site erosion during future inspections. The DOE staff also observed the condition of the retention pond (Figure 4). The retention pond was dry at the time of the inspection.

The NRC inspectors independently measured the ambient gamma exposure rates using a hand-held survey meter (RadEye PRD, NRC No. 31894, calibrated to cesium-137, calibration due date of 11/09/19). The background exposure rates ranged from 3-10 microRoentgens per hour ($\mu\text{R/hr}$). The exposure rates on top of the disposal cell ranged from 4-12 $\mu\text{R/hr}$, and the exposure rates around the disposal cell ranged from 3-14 $\mu\text{R/hr}$. No residual radioactive contamination or naturally occurring radioactivity was identified at the disposal cell.

4 Conclusions

The NRC inspectors concluded that the DOE inspectors conducted the site inspection in accordance with the requirements specified in the LTSP dated May 1998. The disposal

cell appeared to be structurally intact, and the cover was in excellent condition. No threats to the integrity of the disposal cell were identified.

5 Meeting Summary

The NRC inspectors participated in planning meetings with the DOE site manager, site contractors, and Colorado state representative prior to the site inspection. During this meeting, the participants discussed topics such as site status, inspection plan, and potential hazards.

6 Persons Contacted

M. Cosby, Environmental Protection Specialist, State of Colorado
D. Marshall, Ecologist, Navarro
K. Meadows, Site Lead, Navarro
J. Nguyen, Site Manager, DOE
D. Traub, Site Lead, Navarro
K. Whysner, Site Lead, Navarro



Figure 1: View of the Slick Rock Disposal Cell and apron from the south



Figure 2: Rip-rap apron, with vegetation, at south corner of the disposal cell



Figure 3: Erosional gully near retention pond (facing north towards disposal cell)



Figure 4: Retention pond south of disposal cell (facing south)

NRC OBSERVATIONAL SITE VISIT AT THE SLICK ROCK, COLORADO DISPOSAL SITE,
 DATED - JUNE 28, 2019

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