



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 E LAMAR BLVD
ARLINGTON, TX 76011-4511

January 12, 2018

MEMORANDUM TO: Docket File WM-00054

THROUGH: Ray L. Kellar, P.E., Chief */RA/*
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

FROM: Linda Gersey, Health Physicist */RA/*
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

SUBJECT: NRC OBSERVATIONAL SITE VISIT AT THE GRAND JUNCTION
DISPOSAL SITE

On December 6, 2017, the U.S. Nuclear Regulatory Commission (NRC), Region IV Office, conducted an observational site visit at the U.S. Department of Energy's (DOE) Grand Junction Disposal Site, in Grand Junction, Colorado. This observational site visit was conducted in accordance with NRC guidance dated September 7, 2012, (ADAMS Accession No. ML12213A418). The purpose of the site visit was to observe the DOE's representatives routine, annual site inspection. Enclosed to this memorandum is the NRC's trip report for this observational site visit.

In summary, the DOE's representatives conducted an annual inspection in accordance with the Interim Long-Term Surveillance Plan dated April 1998, (ADAMS Accession No. ML12333A286) No significant regulatory issues or safety concerns were identified during the site visit.

Docket: WM-00054

Enclosure:
NRC Trip Report

cc: R. Bush, Site Manager
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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: WM-00054

Report: WM-00054/17-001

Licensee: U.S. Department of Energy

Facility: Grand Junction Disposal Site

Location: Mesa County, Colorado

Date: December 6, 2017

Inspector: Linda M. Gersey, Health Physicist
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Approved by: Ray L. Kellar, P.E., Chief
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Attachment: Photographs Taken at the Grand Junction Disposal Site

Enclosure

NRC Trip Report

1 Background

Construction of the Grand Junction Disposal Site began in 1990. The site was previously known as the Cheney disposal cell. The cell was constructed to accept wastes from the Grand Junction Processing Site, historically known as the Climax uranium mill. The disposal site was also constructed to accept "vicinity property materials" from surrounding areas.

Vicinity properties were private and commercial properties that were previously constructed with mill-related contaminated materials and soils. The Climax uranium mill released approximately 500,000 cubic yards of material for use as construction fill material from 1951-1966. Some vicinity property material was reclaimed and returned to the former Climax mill site for storage.

The bulk of the mill and vicinity property materials were transferred to the Grand Junction Disposal Site by 1994. An estimated 4.4 million cubic yards of contaminated materials were placed in the disposal cell. Additional cleanup and disposal of vicinity property material, under the Uranium Mill Tailings Remediation Action Project, continued until 1998. After 1998, vicinity property materials continued to be collected, but the material was collected with State agency oversight.

The 60-acre disposal cell is situated on a 360-acre site located 18 miles southeast of Grand Junction, Colorado. The nearest resident is located approximately 2 miles north of the site. Portions of the disposal cell cover were completed by 1994, but an area of the cell remains open. This site still accepts mill or tailings-related wastes for disposal from DOE Title I or II sites, including vicinity property materials.

The Interim Long Term Surveillance Plan (LTSP) dated April 1998, (ADAMS Accession No. ML12333A286) offers two alternatives for cell closure. The cell will either remain open until 2023 or until the cell is filled to capacity. The open portion of the cell had a capacity of up to 250,000 cubic yards of additional material. This open area is 21 acres in size. The depth of the open area varies from 10 to 30 feet deep.

The disposal cell cover has been completed in some areas of the cell. The cover consists of a radon barrier, frost protection layer, bedding layer, and rip-rap for erosion protection. The cover is sloped to allow for runoff of precipitation, and rip-rap armored aprons are used to route precipitation away from the disposal cell.

The previous NRC observational site visit was conducted on November 14, 2012, (ADAMS Accession No. ML12335A095). No regulatory issues or safety concerns were identified during the site visit.

2 Site Status

The site consists of a partially covered disposal cell located within a fenced boundary. Several structures remain onsite. These structures are used to support the disposal activities. The DOE controls site access by use of fences, warning signs, and locked gates.

Groundwater monitoring is not required at this site. However, the DOE conducts annual groundwater monitoring at three wells as a best management practice to assess the disposal cell's performance and to verify that groundwater that might be present in the paleochannels is not affected if seepage (transient drainage) occurs from the disposal cell. Three monitoring wells are installed in the western portion of the disposal cell. Review of the groundwater sampling results are conducted by the NRC project manager.

The DOE installed a test cell adjacent to the disposal cell. The test cell is used to demonstrate inexpensive ways to transform existing low-permeability covers into evapotranspiration type covers in arid and semi-arid regions. For example, the test cell is used to study the impacts of deep-rooted vegetation on tailings covers. The results of the test will help DOE to decide whether to use herbicides to eliminate vegetation on existing disposal covers. The cell cover studies are ongoing.

The last annual DOE inspection of the Grand Junction Disposal Site was conducted in December 2016. In accordance with the Interim LTSP, the annual inspection requirement applies only to the closed and completed portion of the disposal cell. The DOE inspectors concluded that the disposal cell and associated surface water diversion and drainage structures were in good condition and functioning as designed. No follow-up or contingency inspections were required in response to the 2016 inspection findings.

3 Site Observations and Findings

The DOE inspectors are tasked to inspect the completed portion of the cell cover, diversion channels, site features, and outlying areas. The site-specific surveillance features include site access roads, entrance gates, fences, entrance and perimeter signs, boundary monuments, and monitoring wells. The granite site markers have not been installed. The markers will be installed after the disposal cell has been permanently closed. This site observation visit did not include evaluation of the open cell activities or groundwater monitoring well data.

To conduct the site inspection, DOE and its contractors created an inspection checklist. During the site tour, the DOE inspectors checked for evidence of erosion, settlement, slumping, displacement, and any other feature that required maintenance or repair. The rock surfaces on the cover, side slopes, and diversion channels were found to be in excellent condition.

A new paved road had been installed between the highway and the site. The road was observed to be in excellent condition. The fences and gates were also in good condition. The outlying areas were used to stockpile cover materials for eventual closure of the open portion of the cell. These cover materials included shale, clay, rock, and topsoil. No significant erosion was identified in or around these stockpiled materials.

The Interim LTSP requires removal of deep-rooted shrubs on the cover of the cell. As noted earlier, DOE was studying the impacts of vegetation on cell covers. Until the study has been completed, the DOE plans to continue removing deep-rooted vegetation from the cover area.

During the observational site visit, the NRC inspector measured the ambient gamma exposure rates using a Ludlum Model 19 microRoentgen meter calibrated to radium-226 (NRC No. 015518, calibration due date of October 25, 2018). The background exposure

rates ranged from 8-13 microRoentgens per hour ($\mu\text{R/hr}$). The exposure rates around the disposal cell ranged from 8-13 $\mu\text{R/hr}$. The exposure rates on top of the disposal cell ranged from 12-18 $\mu\text{R/hr}$. As expected, the highest measurements were observed near the boundary to the open portion of the disposal cell, an area where radioactive materials were present.

4 Conclusions

The NRC inspector concluded that the DOE inspectors conducted the site inspection in accordance with the Interim LTSP dated April 1998. The tailings impoundment 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 inspector participated in a planning meeting with the DOE site manager and site contractor prior to the site inspection. During this meeting, the participants discussed topics such as site status, inspection plan, and potential hazards.

6 Persons Contacted

R. Bush, DOE Office of Legacy Management
EK Roemer, Site Lead, Navarro Research and Engineering, Inc.
P. Wetherstein, Navarro Research and Engineering, Inc.
S. Woods, Navarro Research and Engineering, Inc.
M. Cosby, Colorado Department of Public Health and the Environment
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Figure 1:
Closed portion of disposal cell with open portion in background



Figure 2:
South Diversion Channel



Figure 3:
Portion of Test Cell

NRC OBSERVATIONAL SITE VISIT AT THE GRAND JUNCTION DISPOSAL SITE – DATED
 JANUARY 12, 2018

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