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

August 12, 2015

MEMORANDUM TO: Docket File 040-01341

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

FROM: Robert J. Evans, Ph.D., Senior Health Physicist ***/RA/***
Repository and Spent Fuel Safety Branch
Division of Nuclear Materials Safety

SUBJECT: OBSERVATIONAL SITE VISIT AT THE EDGEMONT DISPOSAL SITE

On July 7, 2015, an inspector from the U.S. Nuclear Regulatory Commission's (NRC) Region IV Office conducted an observational site visit at the U.S. Department of Energy's (DOE) Edgemont disposal site in Fall River County, South Dakota. This site visit was conducted in accordance with the guidance provided in the NRC's Memorandum dated April 17, 2012 (ADAMS accession number ML120930240). The purpose of the site visit was to observe DOE's routine, annual inspection of the Edgemont disposal site. Enclosed to this memorandum is the NRC's trip report for this site visit.

In summary, DOE conducted the annual inspection in accordance with the requirements specified in the NRC-accepted Long-Term Surveillance Plan dated June 1996 (ML15218A423). The disposal cell and associated drainage and diversion channel structures appeared to be in excellent conditions. No significant regulatory issues or safety concerns were identified during the site visit.

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Enclosure:
NRC Trip Report

cc: W. Dam, Site Manager
DOE Office of Legacy Management
2597 Legacy Way
Grand Junction, CO 81503

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DATE	08/10/15	08/12/15		

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket:	040-01341
Report:	040-01341/15-001
Licensee:	U.S. Department of Energy
Facility:	Edgemont Disposal Site
Location:	Fall River County, South Dakota
Date:	July 7, 2015
Inspector:	Robert J. Evans, Ph.D., C.H.P., P.E., Senior Health Physicist Repository and Spent Fuel Safety Branch Division of Nuclear Materials Safety
Approved by:	Ray L. Kellar, P.E., Chief Repository and Spent Fuel Safety Branch Division of Nuclear Materials Safety
Attachment:	Photographs Taken at the Edgemont Disposal Site

Enclosure

NRC Trip Report

1 Background

Mines Development, Inc., a subsidiary of Susquehanna-Western, Inc., constructed and operated the Edgemont mill from 1956-1972. The mill was located adjacent to the Town of Edgemont, South Dakota. The operation of the mill resulted in the production of about 2.3 million tons of tailings material.

In 1974, Tennessee Valley Authority (TVA) acquired the mill. However, TVA decided against using the mill to process uranium ore. The mill was decommissioned from 1986-1989. As part of decommissioning, the tailings material and mill debris were relocated to the Edgemont disposal site, a 360-acre property located about two miles south of the mill. In addition, radioactive vicinity property material was remediated from about 250 properties by the U.S. Department of Energy (DOE) and placed into the disposal cell.

Approximately 4 million tons of tailings, contaminated soil, mill equipment, structural debris, and vicinity property material were placed into the disposal cell. The total radioactivity of the contaminated material placed in the disposal cell was estimated to be about 527 curies of radium-226.

The 100-acre Edgemont disposal cell is situated roughly in the middle of the 360-acre site property. The cell was constructed partially below grade and at the head of an ephemeral drainage pathway. A containment dam was constructed at the down-gradient face of the cell.

The base of the cell consists of a natural shale layer in lieu of a man-made liner. The walls were constructed with compacted clay, averaging 13 feet thick. The 9-foot thick cover consists of clay, fill, and topsoil material. The dam contains clay to minimize seepage and shale for stability. A series of drains (finger, chimney, and toe) were installed to route drainage away from the cell. In addition, a perimeter drainage system was installed to intercept and route surface water around the cell. A rip-rap rock erosion protection cover was installed on portions of the dam and drainage pathways. The remainder of the disposal cell was seeded with native grasses for erosion protection.

The Edgemont disposal cell is classified as a Title II 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's) general license requirements of 10 CFR 40.28. The Long-Term Surveillance Plan (LTSP) explains how DOE will fulfill the general license requirements specified in 10 CFR 40.28. The LTSP for the Edgemont disposal site was approved by the NRC on June 27, 1996, concurrently with the termination of NRC Materials License SUA-816 and turnover of the site to DOE. The NRC announced the turnover of the Edgemont disposal cell site from TVA to DOE, termination of the license, and approval of the LTSP in the *Federal Register* on July 5, 1996 (61 FR 35272).

2 Site Status

The disposal cell is situated on a layer of low-permeability shale that varies in thickness from 300 to 700 feet. The uppermost aquifer is below this shale layer. Due to the thickness of the shale layer and the depth of the aquifer, the local groundwater is not

expected to be contaminated by radioactive material in the disposal cell. Thus, groundwater monitoring is not required at this site.

Site features include four corner boundary monuments, one site marker, one entrance warning sign, and two perimeter signs. The site perimeter is barbed-wire fenced. One primary and three secondary gates were installed for site access. The LTSP requires DOE to inspect the Edgemont disposal site at least once every calendar year. The DOE inspectors typically observe the status of site features during each annual inspection.

Records indicate that the site was reseeded in the fall of 1989. Section 3.7.2 of the LTSP requires DOE to conduct annual visual inspections of the vegetation density. Although the LTSP does not clearly state the acceptance criteria for vegetation density, the DOE inspectors typically compared the onsite vegetation density to the densities of vegetation on adjacent properties. The DOE allows livestock to graze on the property. The DOE implemented a voluntary vegetation monitoring program in 2009, in part, to ensure that livestock does not over-graze the property.

The DOE conducted the last site inspection on July 1, 2014. At that time, the disposal cell and associated surface water diversion and drainage structures were noted to be in excellent conditions and functioning as designed. No evidence of erosion, settling, slumping, or rock degradation was identified. Some minor erosion was noted on steep slopes in the area between the disposal cell and the site perimeter in the northeastern corner of the property, but the erosion was noted to be stable. Site vegetation density was determined to be acceptable, with no evidence of over-grazing. Nothing was identified during the inspection that required follow up maintenance or repair.

3 Site Observations and Findings

The DOE staff conducted the annual inspection for calendar year 2015 on July 7, 2015. The purposes of the annual inspection are to confirm the integrity of the visible features of the site, to identify changes in conditions that may affect site integrity, and to determine the need for maintenance or additional inspection and monitoring. Detailed instructions for implementing the annual inspection are provided in Section 3 of the LTSP.

The LTSP requires the DOE inspectors to observe three areas: the containment dam and diversion channels; the cover of the disposal cell; and the site perimeter and outlying areas within a quarter mile of the site. To conduct the annual inspection, DOE and its contractors created an inspection checklist. The checklist included requirements to inspect the disposal cell as well as site features such as fences, the boundary monument, site markers, perimeter signs, and entrance gates. The NRC inspector observed the DOE inspectors implementing the site-specific checklist. The DOE plans to issue a formal report, concurrently with other site inspections, at the end of the calendar year.

The NRC inspector observed that the disposal cell and surrounding diversion and drainage structures appeared to be in excellent condition. No erosion or slumping was observed on or around the cell. Thick vegetation and standing water was identified on the cell, but the standing water appeared to be the result of recent rains. At the time of the onsite visit, no livestock was observed on the property. No deep-rooted trees were

observed on or immediately adjacent to the disposal cell. The DOE staff plans to spray a commercial herbicide on noxious weeds in September 2015.

The NRC inspector conducted radiological surveys using a Ludlum Model 19 microRoentgen survey meter (NRC No. 015546, calibration due date of 07/22/15, calibrated to radium-226). With a background of 10-12 microRoentgens per hour (μR/hr), as measured on the access road to the site, measurements across the property ranged from 8-15 μR/hr. The surveyed areas included drainage pathways down-gradient from the disposal cell. The ambient gamma radiation measurements across the site were indistinguishable from background levels indicating that no residual radioactivity or naturally occurring radioactivity was identified on the surface of the site.

During the observational site visit, the NRC inspector discussed with DOE representatives the status of livestock grazing within the site property. Section 3.6.1 of the LTSP states that fences were installed to prevent livestock grazing. However, DOE currently allows onsite grazing. The DOE implemented a voluntary vegetation monitoring program in 2009, in part, due to onsite grazing. At the time of the DOE site inspection, the onsite grasses appeared to be comparable with offsite properties, with no evidence of over-grazing. The NRC inspector discussed with DOE staff the potential discrepancies between the wording of the LTSP and annual report, and DOE's desire to allow property reuse through onsite grazing. The DOE staff agreed to review the potential discrepancies and consider updating the LTSP as appropriate.

4 Conclusions

The DOE inspectors conducted the site inspection in accordance with the site-specific checklist, LTSP, and 10 CFR 40.28 requirements. The disposal cell and adjacent dam, drainage, and diversion structures appeared to be in excellent condition with no erosion, slumping, or large trees on the cell. The ambient gamma radiation levels across the site were indistinguishable from background levels. The NRC inspector discussed with DOE staff the potential discrepancies between the LTSP, annual report, and as-found site conditions regarding livestock grazing. The DOE representatives agreed to review and update the LTSP as appropriate.

5 Meeting Summary

The NRC inspector participated in a pre-planning meeting with the DOE site manager and DOE representatives prior to the site inspection. During this meeting, the NRC and DOE representatives discussed topics such as site status, inspection plan, and potential physical hazards. The inspector discussed the final site observations with DOE staff at the conclusion of the onsite visit.

6 Persons Contacted

W. Dam, Site Manager, U.S. Department of Energy
R. Johnson, Title II Manager, Stoller Newport News Nuclear (SN3)
S. Kaufman, FUSRAP Technical Lead, Stoller Newport News Nuclear (SN3)
D. Traub, Project Manager, Stoller Newport News Nuclear (SN3)

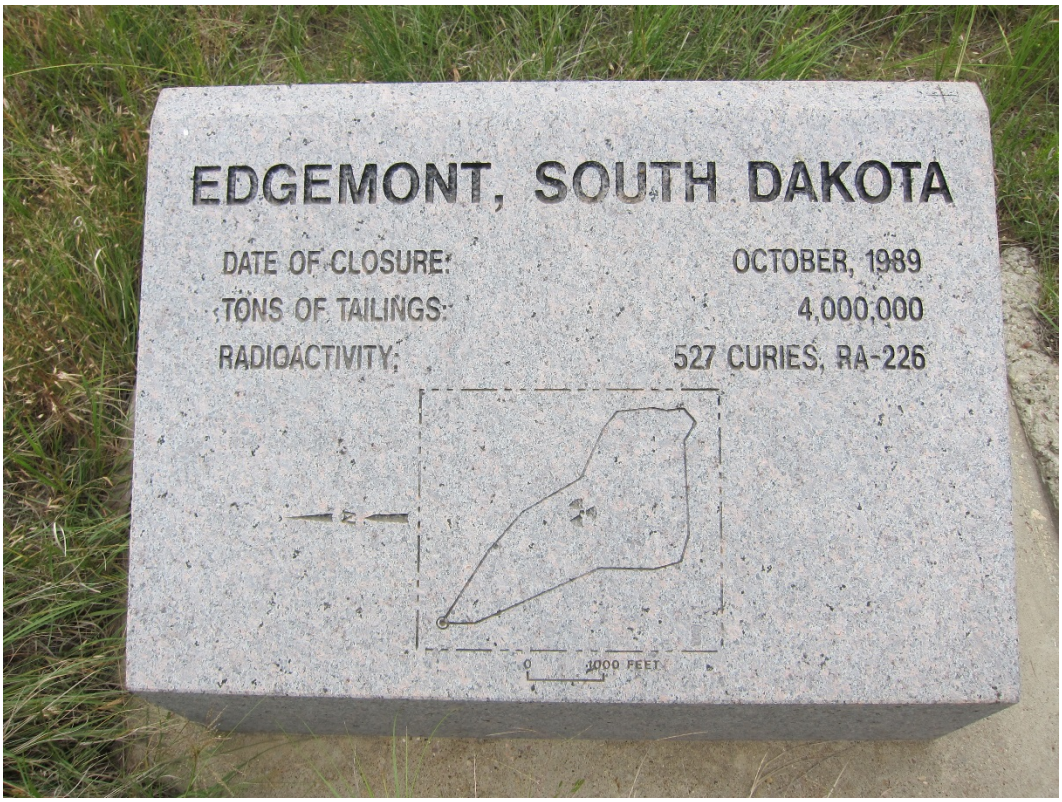

Figure 1: Edgemont disposal site marker near entrance gate

Figure 2: Entrance sign with disposal cell in background (west side looking east)

Figure 3: Southwest corner of cell looking east; standing water in grass in foreground

Figure 4: Tailings embankment with rip-rap cover, southwest corner (looking east)

Figure 5: Southern end of tailings dam, looking southeast towards intersection of drainage channel and east/west diversion channels

Figure 6: East diversion channel (foreground) and tailings embankment (background)