



Department of Energy

Washington, DC 20585

April 5, 2019

WM-00054

Mr. Thomas R. Lancaster
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Mail Stop T5-A10
Washington, DC 20555-0001

Subject: Evapotranspiration Cover Pilot Study at the Grand Junction Disposal Site (WM-54)

Dear Mr. Lancaster:

The purpose of this letter is to inform the U.S. Nuclear Regulatory Commission of U.S. Department of Energy Office of Legacy Management's (DOE-LM) plans for an evapotranspiration cover pilot study at the Grand Junction, Colorado, Disposal Site (GJDS). The pilot study is the next phase of research that began in 2007 to evaluate hydrologic performance and long-term vegetation management of rock-armored disposal cell covers.

Ecological and soil-forming processes are changing the engineering properties of rock-armored disposal cell covers. The rock riprap, designed to control erosion, creates a favorable habitat for deep-rooted plants by reducing soil evaporation and trapping windblown dust, seeds, and decaying plant litter, thereby providing the water and nutrients needed for plant germination and establishment. At many DOE-LM sites, long-term surveillance plans specify vegetation control on disposal cell covers; this typically includes the frequent use of herbicides. However, soil-forming processes increase the saturated hydraulic conductivity (K_s) value of low-permeability radon barriers even when covers are kept denuded by spraying herbicides. Compacted soils become looser, and almost all engineered soils gain structure, the formation of soil aggregates (clods) separated by planes of weakness (cracks). For a test cover at the GJDS *without* vegetation, the radon barrier K_s value increased two orders of magnitude within six years, causing relatively high percolation rates.

In contrast, for a twin test, a comparable increase in K_s did not cause percolation after vegetation established because of the greater evapotranspiration and soil drying provided by plants. In other words, spraying vegetation can cause percolation in rock-armored covers; letting plants grow can prevent percolation.

The purpose of the pilot study is to determine if evapotranspiration will be adequate to prevent percolation if DOE-LM discontinues spraying herbicides and either allows or enhances natural plant succession. DOE-LM plans to prepare a work plan and begin installation of the pilot study on the Grand Junction disposal cell in fiscal year (FY) 2019 and will begin monitoring the pilot study in FY 2020. The installation of test plots will not involve altering or adding soil to the existing cover profile. Pilot study test plots will be monitored in concert with exiting lysimeter studies at the GJDS. Monitoring will include plant succession and abundance, evapotranspiration, water storage, percolation, and radon attenuation, and the study will also monitor for uptake and accumulation of tailings elements in above-ground plant tissue.

NM5501



Thomas R. Lancaster

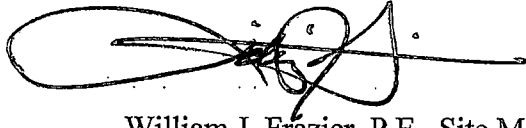
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Please contact me at (970) 248-6041 or William.Frazier@lm.doe.gov, if you have any questions.
Please address any correspondence to:

U.S. Department of Energy
Office of Legacy Management
2597 Legacy Way
Grand Junction, CO 81503

Sincerely,

A handwritten signature in black ink, appearing to read 'W. Frazier', with a large, stylized flourish extending to the left.

William J. Frazier, P.E., Site Manager
Office of Legacy Management

cc:

N. Orlando, NRC
D. Barr, DOE-LM (e)
J. Dayvault, DOE-LM (e)
K. Roemer, Navarro (e)
N. Kiusalaas, Navarro (e)
W. Waugh, Navarro (e)
DOE Read File
File: GRJ 0030.10 (records)