



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 6, 2022

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

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION'S STAFF REVIEW OF 2021 ANNUAL SITE INSPECTION AND MONITORING REPORT FOR URANIUM MILL TAILINGS RADIATION CONTROL ACT TITLE II SITES

Dear Mark Kautsky:

I am writing in response to the U.S. Department of Energy (DOE) report entitled, "2021 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title II Disposal Sites," dated November 2021, (Agencywide Documents Access and Management System [ADAMS] Package Accession No. [ML21334A298](#)). The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the six DOE site inspection reports and have comments on two of the six sites.

Bluewater, New Mexico, Disposal Site

1. In section 1.7.2, DOE states that bedrock aquifer monitoring wells OBS-3 and S(SG) were found to be non-representative of aquifer conditions, but continue to be sampled in accordance with the long-term seismic program (LTSP) until decommissioning is approved by the NRC. The NRC staff is not aware of a DOE request for decommissioning of wells OBS-3 and S(SG).

Shirley Basin South, Wyoming, Disposal Site

Overall, NRC staff finds the report is consistent with the requirements of the December 2004 LTSP.

1. In Section 6.3, the 2021 report states the site is comprised of 1527 acres. While this is correct, it differs from the value in the LTSP (1512 acres). The value in the LTSP is only for Parcel 1. The value in the 2021 report includes both parcels, which is correct. Future reports should include a note on the discrepancy and why the property is 1527 acres.
2. On Page 6-10, the 2021 report states

Once groundwater conditions have stabilized, LM will determine if the monitoring program remains adequate. Groundwater elevations, apparent trends in flow directions and water quality evaluations from existing Main Sand Aquifer wells will inform LM future actions to track potential offsite migration of site contaminants.

NRC staff is interpreting these statements as part of the “evaluative monitoring work plan” required by the LTSP (page 3-8). While NRC staff agrees in principle with this conceptual plan, additional information is needed. NRC requests the following comments be addressed in the next annual report:

- a. Define the criteria for stabilized groundwater conditions. Also, please provide DOE’s estimate on when the stabilization would be achieved.
- b. Two of the three northernmost wells in the Upper Sand Aquifer (100-SC and 102-SC) may be exhibiting an increasing trend but the third (54-SC) appears to have been relatively stable. However, review of the boring log suggests a limited water column in the well. Has the limited water column affected the groundwater elevations and/or quality at this well? The same question for well 5-SC.
- c. Assuming the pre-2009 data for well 110-DC would have exhibited a trend in which the groundwater elevations were below those at well 5-DC if the data were available, what is the likelihood that water levels in Pit 33 on the northern abutting Pathfinder Mines Corporation property contribute significantly to the rebound to groundwater elevations observed for the Shirley Basin South wells completed in the Main Aquifer considering that the Lower Wind River Aquifer has: (1) a connection to the Main Aquifer in that area due to historic mining activities; (2) a higher transmissivity; (3) a predicted potentiometric head of 6990 ft-MSL at steady-state conditions consistent with the Shirley Basin South rebounding elevations; and (4) has predicted southeasterly flow consistent with an expected regional flow to the Little Medicine Bow River (see Petrotomics 1996 alternate concentration limit application ([ML081020013](#))). In addition, due to the above and the recently approved in situ recovery operations at the Pathfinder Mines Corporation property, please describe DOE plans for continued monitoring.

3. On page 6-19, the 2021 report states

DOE also previously noted that selenium is a relatively poor indicator constituent for tailings seepage, as selenium levels were measured to be relatively low in tailings water and attenuated easily (DOE, 2011a).

However, DOE (2011a) states that selenium “is not likely to be an early indicator of potential cell leakage” (page 17) not that it is a relatively poor indicator. DOE (2011a) further states that selenium, uranium radium-226 and radium-228 has been observed in groundwater in [these] highly mineralized areas and may be attributed to that mineralization rather than the leachate from the cell. NRC staff agrees that a highly localized mineralized area may be a potential source of selenium in groundwater and that selenium is a poor early indicator of any plume migration due to attenuation but disagrees that selenium is a poor indicator constituent of the tailings seepage.

4. Please clarify in the next inspection report the open symbols for Thorium-230 in Figures 6-10 and 6-11.

The NRC staff is not requesting a response to the above comments. These comments should be considered and addressed in the next inspection report submitted to the NRC.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "[Public inspections, exemptions, requests for withholding](#)," of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of the NRC's ADAMS. ADAMS is accessible from the NRC Web site at <https://www.nrc.gov/reading-rm/adams.html>.

If you have any questions concerning the NRC review of the report, please contact me at 301-415-3285 or by email at Brittany.Bolz@nrc.gov.

Sincerely,



Signed by Bolz, Brittany
on 09/06/22

Brittany C. Bolz, Project Manager
Uranium Recovery and Materials
Decommissioning Branch
Division of Decommissioning, Uranium Recovery
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket Numbers:
40-8902, 40-1341, 40-8904, 40-9090
WM-00054, 40-6659

cc: ListSers for:
Bluewater, NM
Edgemont, SD
L-Bar, NM
Maybell West, CO
Sherwood, WA
Shirley Basin South, WY

U.S. Nuclear Regulatory Commission Staff's Review of 2021 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title II Sites DATE September 6, 2022

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