UNITED STATES
NUCLEAR REGULATORY COMMISSION
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September 15,2020

Bryan M. Frey, P.E.
Installation Services Directorate,
Environmental Division
Office of the Deputy Chief of Staff, G-9
Department of the Army
600 Army Pentagon
Washington, DC 20310-00600

SUBJECT: TECHNICAL EVALUATION REPORT REGARDING U.S. ARMY FINAL SITE CHARACTERIZATION REPORT FOR AREA 2, SOLID WASTE MANAGEMENT UNIT 11, DUGWAY PROVING GROUND, DUGWAY, UTAH

Dear Mr. Frey:

I am writing to provide you with the U.S. Nuclear Regulatory Commission (NRC) staff's technical evaluation report regarding the U.S. Army's *Final Characterization Report Area 2 of SWMU-11* (Solid Waste Management Unit 11) *Dugway Proving Ground Dugway, Utah* (hereafter, the Final Characterization Report; available in NRC's Agencywide Documents Access and Management System [ADAMS] at Accession Number ML20083M819). The purpose of the NRC staff's review is to ensure the U.S. Army is on track to appropriately evaluate remedial actions that will result in dose criterion being met set forth in Title 10 of the *Code of Federal Regulations*, Part 20, Section 1402 (10 CFR 20.1402) for sites that will be released for unrestricted use or is consistent with the requirements in 10 CFR 20.1403(b) for sites that will be released for restricted use. Specifically, the NRC staff evaluated the process used by the Army to identify and screen radionuclides of concern (ROCs) and develop site-specific derived concentration guideline limits (DCGLs) for the ROCs for both unrestricted and restricted release scenarios. The results of the NRC staff's evaluation are summarized below and are discussed in further detail in the enclosure.

The NRC's role at Area 2 of SWMU-11 is consistent with the NRC's monitoring approach defined within the Memorandum of Understanding (MOU) between the NRC and the U.S. Department of Defense (DoD), executed on April 28, 2016 (hereafter the NRC/DoD MOU; ADAMS Accession Number ML16092A294). Under this approach, the NRC staff prepares monitoring reports with the results of its review documented in accordance with the regulations cited above and provides DoD with these reports and any written comments. The Army's responsibility for meeting any other relevant federal and/or State regulatory requirements is independent of this NRC review.

The NRC staff and its contractor, Oak Ridge Associated Universities, reviewed the Final Characterization Report with a focus on previous site investigations to identify radionuclides, screening of ROCs, and development of DCGLs. Overall, the NRC staff determined the Army's dose-based method to screen ROCs and development of DCGLs for the modeled ROCs are acceptable. This conclusion is based on the NRC staff's findings that:

- The Army's use of a dose-based ROC screening methodology produces similar results to NRC's DandD code when evaluating similar conceptual models, except for a small set of modeled radionuclides (e.g., H-3, K-40, and Eu-155), none of which are expected to be significant to public health and safety at Area 2 based on the results of prior site investigations. While NRC staff noted concerns with the Army's use of a twice-background screening methodology, NRC staff found that the only radionuclide screened out by this method (i.e., K-40) is a naturally occurring radionuclide and not likely to be associated with previous site operations at Area 2.

- The Army utilized conservative receptors for the respective release scenarios with a comprehensive set of corresponding exposure pathways and appropriate mathematical models to develop DCGLs.

- The Army selected input parameter values that are based on a generally acceptable hierarchy of sources in Area 2 of SWMU-11 to develop DCGLs. For the external gamma shielding factor, for which the NRC staff noted an exception to this finding, the NRC staff found the exception is not expected to have a significant impact on DCGLs because the deterministically determined DCGLs are consistent with the results from the Army's and NRC staff's independent probabilistic analyses, which included a fuller range of shielding factor values.

The NRC staff identified potential quality issues in data collected during previous site investigations used to identify ROCs. Although the list of ROCs includes several radionuclides that may be anomalous artifacts of analytical methods and are thus conservatively included, the possibility of the presence of additional ROCs given operational history (e.g., Am-241 and Ni-63 in certain chemical agent detectors) was not addressed. Therefore, the NRC staff recommends that gross alpha/beta analyses of samples occur during all future site investigations. Gross alpha/beta analyses can identify discrepancies between gross alpha/beta activity and total activity of identified alpha/beta-emitting radionuclides in samples. Thus, gross alpha/beta analyses ensure radionuclides that may be hard to detect and are not specifically included in the analysis could be considered. Also, the NRC staff recommends that the Army improve the defensibility of background determinations prior to final status determination as relying on historical data involving use of multiple laboratories may not be optimal.

Based on the NRC staff findings noted above, if residual radioactivity remaining in Area 2 of SWMU-11 conforms to the DCGLs after the Army's remedial action, the NRC staff would have reasonable assurance that Area 2 would meet the 25-mrem/yr (0.25-mSv/yr) dose criterion for either unrestricted use in 10 CFR 20.1402 or restricted use in 10 CFR 20.1403(b) for the suite of radionuclides evaluated. Also, in implementing the NRC staff's recommendation to conduct gross alpha/beta analyses during future site investigations, the Army could demonstrate that it has not missed any hard-to-detect or other radionuclides not considered in the current analysis.

In accordance with 10 CFR 2.390 of the NRC's Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders, 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 ADAMS. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

I will contact you in the near future to answer any questions you may have regarding the technical evaluation report, but if you have any immediate questions, please contact me at (301) 415-0140 or at Christopher.Grossman@nrc.gov.

Sincerely,

Christopher Grossman, Project Manager
Low-Level Waste and Projects Branch
Division of Decommissioning, Uranium Recovery
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Enclosure: Technical Evaluation Report

REGISTERED LETTER – RETURN RECEIPT REQUESTED

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